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## Summary

A test of a small three-bladed model rotor, with geometry typical of that used on tilt-rotor aircraft, was conducted in the U.S. Army Aeroflightdynamics Directorate's anechoic hover chamber. The objectives of the test were to determine the hover performance of the rotor and investigate the pressure distributions on a blade operating at various collective pitch angles and tip speeds. This report presents the rotor performance data and blade surface pressures.

## Nomenclature

$c$	rotor chord length, in.
$C_p$	blade surface pressure coefficient, $(p - p_\infty)/0.5\rho(\Omega r)^2$
$C_Q$	rotor torque coefficient, $Q/\rho(\Omega R)^2(\pi R^3)$
$C_T$	rotor thrust coefficient, $T/\rho(\Omega R)^2(\pi R^2)$
FM	rotor figure of merit, $(C_T)^{1.5}/C_Q^{1/2}$
$l$	airfoil lower surface
$P$	blade surface pressure, lb/ft <sup>2</sup>
$P_\infty$	ambient pressure, lb/ft <sup>2</sup>
$Q$	rotor torque, ft-lb
$r$	blade radial station, ft
$R$	rotor radius, 2 ft
rpm	rotor rotation speed, rev/min
$t/c$	maximum thickness to chord ratio
$T$	rotor thrust, lb
$u$	airfoil upper surface
$x$	chordwise distance from leading edge, in.
$y$	coordinate normal to blade chord, in.
$\beta$	blade twist relative to 0.75R, deg

$\theta_c$	collective angle at 0.75R, deg
$\rho$	air density, slugs/ft <sup>3</sup>
$\sigma$	thrust-weighted solidity, 0.1194
$\Omega$	rotor rotational speed, rad/sec

## Introduction

The accurate prediction of hover performance is particularly important for tilt-rotor aircraft since the payload represents about thirty percent of the aircraft's gross weight. NASA Ames Research Center has recently conducted a series of tests to measure tilt-rotor hover performance and wake geometry at various test conditions (refs. 1 and 2). Reference 3 reported the correlation of these test results with predictions using a rotorcraft analysis program, CAMRAD. They found that the theory underpredicted the XV-15 ATB (advanced technology blade) rotor hover figure of merit at high thrust coefficients ( $C_T/\sigma > 0.14$ ). In addition, the measured figure of merit remained a high level at high thrust coefficients while the predicted value dropped off.

The purpose of this test was to obtain a blade surface pressure and performance data set which could be used to investigate the reason for the discrepancy between the measured and predicted performance of highly twisted rotors. This report presents the performance and pressure data obtained from this test but does not attempt to draw any conclusions. However, the reader may consult a paper by Tung and Branum (ref. 4), which speculates on the cause of the underprediction of the high thrust theoretical figure of merit.

This work represents the contributions of many excellent people. We would like to extend our thanks to Bill Harper, Brad Wick, and Marty Maisel who were instrumental in initiating our studies. Special thanks are due to Andy Morse who assisted us through the whole test and to Frank Caradonna for his suggestions.

## Description

### Rotor

The rotor tested is a small three-bladed rotor designed to operate at thrust coefficients typical of current tilt-rotor aircraft but does not represent any particular full scale configuration. The rotor was mounted on the Aeroflight-dynamics Directorate's rotary wing test stand in the Army hover chamber as shown in figure 1. The rotor system has a diameter of 4 feet and a thrust-weighted solidity of 0.1194. The blades are constructed of birch wood and have a total twist of  $32^\circ$  between the root cutout and the tip. The blade thickness tapers nonlinearly from the root to the tip. Given in table 1 are the twist, chord, and maximum thickness distributions of the blade as a function of radius. The blade section airfoils were originally intended to represent NACA 64 series airfoils, but templates made of 12 radial locations along the hand crafted blade showed that the actual airfoil sections differed from that series. These templates were digitized so that the actual airfoil geometry could be determined for subsequent analysis. The actual airfoil coordinates are included in appendix A. To obtain surface pressure data for this test, one of the blades was configured with nineteen 0.03 inch diameter pressure tubes. Ten of these tubes were embedded radially along the upper surface of the blade while the remaining tubes were embedded radially along the lower surface. Tap orifices were located at eight radial locations on each pressure tube. Table 2 shows the tap location for both the chordwise and radial directions. Figure 2 shows a partial view of the pressure orifices on the upper surface of the blade.

### Instrumentation

Each of the nineteen pressure tubes in the blade was connected to a Kulite (YQC-250 series) differential pressure transducer using flexible plastic tubing. These pressure transducers were located inside a container above the rotor hub (fig. 2). As shown in the figure the transducers were set close to the center of rotation, 1.5 inches, and aligned vertically so that effects on the pressure measurements, caused by the centrifugal force acting on the transducer diaphragms, would be reduced as much as possible. Calibration checks of each transducer were performed on a daily basis prior to operating the rotor. This was accomplished by comparing each transducer's measured pressure to a known pressure applied at each tap orifice using a Paroscientific pressure calibrator. Thrust and torque data were obtained from the rotor using a six component strain gage balance. Other measurements included ambient temperature and pressure and rotor rpm.

To avoid being influenced by the rotor wake, the ambient pressure sensor was located directly outside of the testing chamber. Pressure data from the rotating system were transmitted to the nonrotating system using a 156 channel Polyscientific slipring. From that point, both pressure and balance data were passed through Pacific differential amplifiers and filtered to 10 Hz. All data were then recorded using an HP 3852A data acquisition system.

### Test Conditions and Procedures

Performance and pressure data were obtained at collective pitch angles ranging from  $0^\circ$  to  $28^\circ$  and rotor speeds of 400, 600, 800, 1200, 1800, and 2400 rpm. Table 3 lists the collective angles and rotor speeds tested. The collective pitch angles were manually set at the hub for each blade using a template at the  $3/4$  radius and a digital protractor. Pressure data were collected at one radial location at a time since each pressure tube had eight radial tap orifices per transducer. This was accomplished by sealing off seven radial locations using strips of two inch wide cellophane tape wrapped chordwise around the blade, thereby leaving just the one remaining radial location open for data measurement. Once data were obtained for that particular collective setting and radial location, another radial location was opened and the previous one sealed off. This was done until data at all eight radial locations were recorded for a range of rpm's. The collective angle was then changed and the process repeated. A check for vacuum leaks was performed each time a new radial location was sealed by using a Paroscientific pressure calibrator.

## Test Results

### Hover Performance Data

The tip speed of 377 ft/sec at 1800 rpm corresponds to a tip Reynolds number of about 500,000. Figure 3 shows the effect of collective pitch angle on  $CT/\sigma$  at 1800 rpm. The solid line indicates two different rates of increasing  $CT/\sigma$  with respect to the collective pitch angles. The  $CQ/\sigma$  as a function of collective pitch angle is given in figure 4. The solid line in this figure represents a third-order polynomial least-squares curve fit of the data. The  $CQ/\sigma$  versus  $(CT/\sigma)^{1.5}$  curve is shown in figure 5. A linear relation is observed for  $(CT/\sigma)^{1.5}$  up to 0.087 with a second linear relationship being seen above that value. The figure of merit for this rotor is shown in figure 6 as a function of  $CT/\sigma$ . The figure of merit reaches a plateau at 0.75 between  $CT/\sigma$  equal to 0.1 and 0.17 and drops off quickly as the  $CT/\sigma$  is increased above that level.

### Pressure Data

The column of air inside the pressure tube is subjected to centrifugal force, so the measured pressure coefficients need to be corrected for this effect. This correction was applied during data reduction. The flexible tubing between the pressure tube at the 85 percent chord location on the upper surface of the blade and its transducer was not functional during the early part of the test but was repaired later in the test. Because of this, some of the figures and data tables do not contain pressure information for that location. In addition, pressure data from the 60 percent chord location on the lower surface of the blade were not obtained due to an inoperable transducer. Typical sectional pressure distributions are shown in figure 7 for all collective angles tested at 1800 rpm. Figures 8(a) and 8(b) are plots of  $C_p$  distributions over a range of collective angles at  $r/R = 0.2$  and  $r/R = 0.75$ , respectively. The surface pressure distributions over a range of rotor speeds are shown in figures 9(a) and 9(b), respectively. From observation, the pressure coefficients do not change very much with the rotor speed. All pressure and performance data can be found in appendix B. Data are organized in order of increasing collective

angles. Multiple asterisks in the data set represent data which were not available due to problems with that particular transducer.

### References

1. Felker, F. F.; Young, L. A.; and Signor, D. B.: Performance and Loads Data from a Hover Test of a Full-Scale Advanced Technology XV-15 Rotor. NASA TM-86854, Jan. 1986.
2. Felker, F. F.; Young, L. A.; Signor, D. B.; and Betzina, M. D.: Performance and Loads Data from a Hover Test of a 0.658-Scale V-22 Rotor and Wing. NASA TM-89419, Apr. 1987.
3. Felker, F. F.; Maisel, M. D.; and Betzina, M. D.: Full Scale Tilt Rotor Hover Performance. J. Am. Helicopter Soc., vol. 31, no. 2, Apr. 1986.
4. Tung, C.; and Branum, L.: Model Tilt-Rotor Hover Performance and Surface Pressure Measurement. Presented at the 46th Annual Forum of the American Helicopter Society, May 1990.

Table 1. Blade characteristics

$r/R$	$\beta$ , deg	$c$ , in	$t/c$
0.155	26.70	4.09	0.466
0.206	23.20	4.05	0.407
0.306	17.80	4.02	0.335
0.405	11.10	3.90	0.269
0.506	8.20	3.77	0.211
0.606	3.80	3.60	0.191
0.707	2.20	3.39	0.162
0.756	0.00	3.25	0.147
0.805	-0.80	3.09	0.138
0.856	-2.60	2.95	0.125
0.906	-3.90	2.78	0.120
0.959	-4.60	2.54	0.107

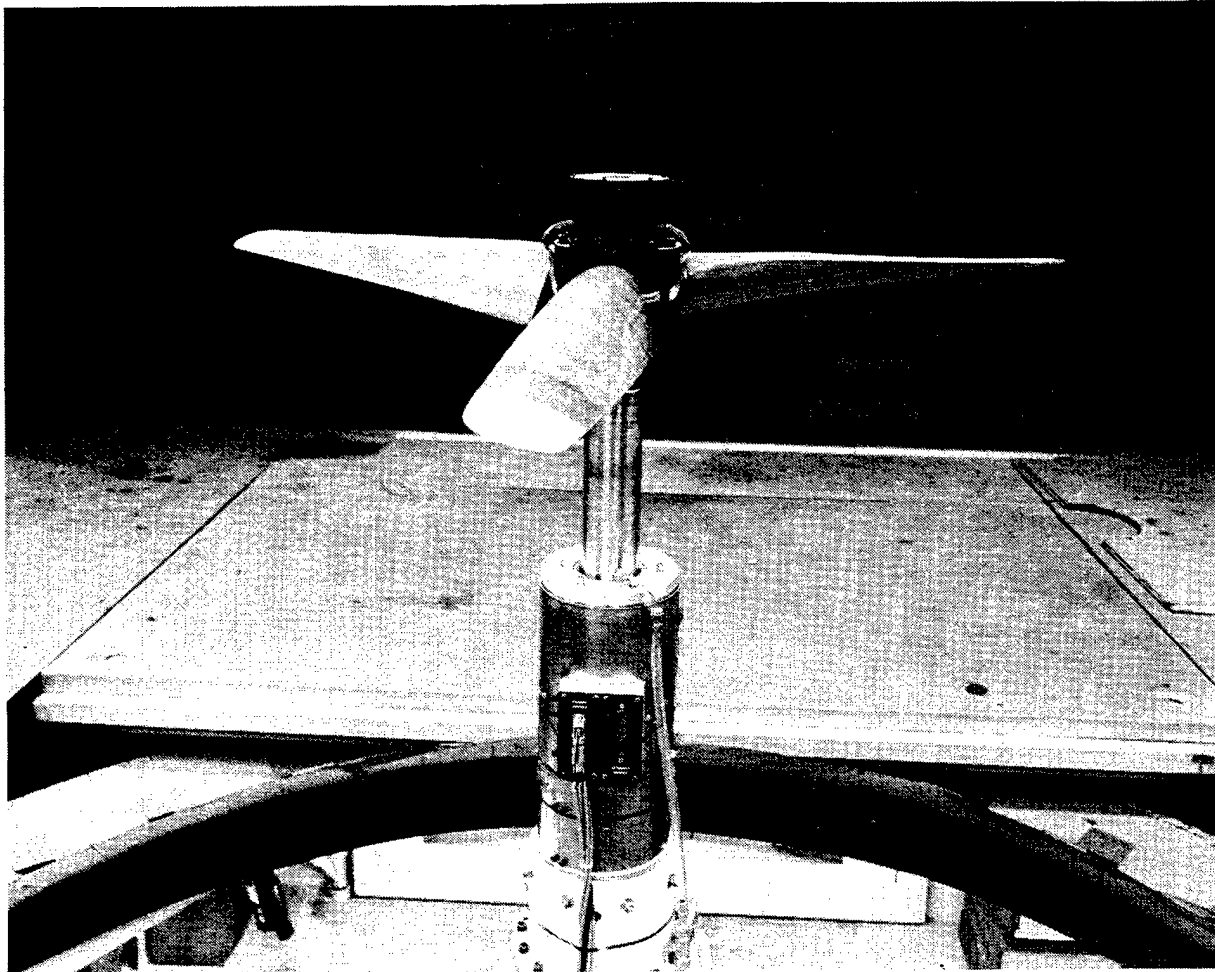
Table 2. Tap locations for the upper (U) and lower (L) surfaces of the pressure blade

$\%c$	6.0	10.0	15.0	25.0	30.0	35.0	40.0	45.0	50.0
$\%R$									
12.5	U	L	U,L	U	L	U	L	U	L
20.0	U	L	U,L	U	L	U	L	U	L
30.0	U	L	U,L	U	L	U	L	U	L
40.0	U	L	U,L	U	L	U	L	U	L
50.0	U	L	U,L	U	L	U	L	U	L
60.0	U	L	U,L	U	L	U	L	U	L
70.0	U	L	U,L	U	L	U	L	U	L
75.0	U	L	U,L	U	L	U	L	U	L

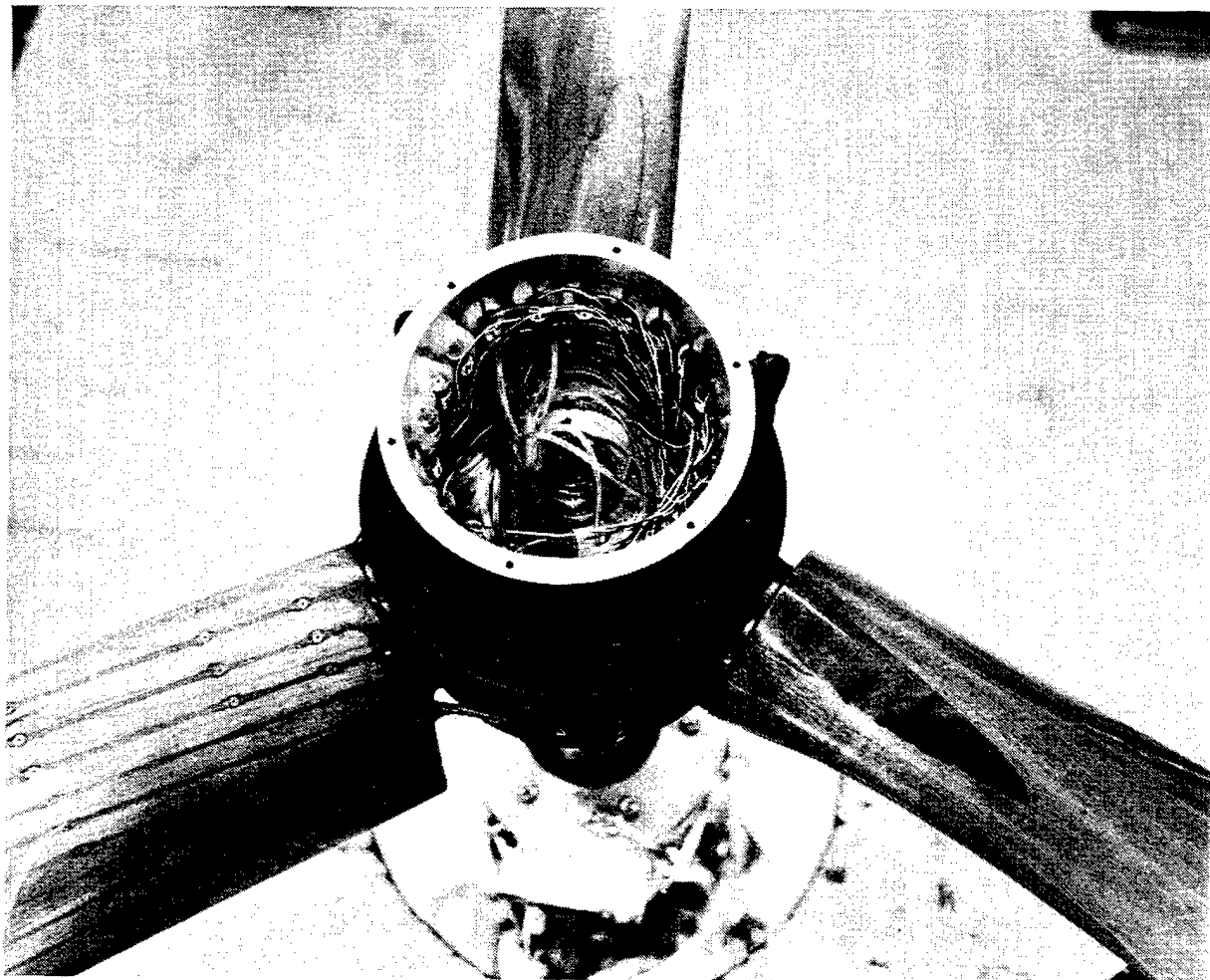
$\%c$	55.0	60.0	65.0	70.0	75.0	80.0	85.0	90.0	95.0
$\%R$									
12.5	U	L	U	L	U	L	U	L	U
20.0	U	L	U	L	U	L	U	L	U
30.0	U	L	U	L	U	L	U	L	U
40.0	U	L	U	L	U	L	U	L	U
50.0	U	L	U	L	U	L	U	L	U
60.0	U	L	U	L	U	L	U	L	U
70.0	U	L	U	L	U	L	U	L	U
75.0	U	L	U	L	U	L	U	L	U

Table 3. Summary of test conditions

$\theta_c$	0	4	8	12	16	18	20	22	25	26	27	28
rpm												
400	.	.	.		.		.		.	.	.	.
600	.	.	.		.		.		.	.	.	.
800	.	.	.		.		.		.	.	.	.
1200	.	.	.	.	.	.	.	.	.	.	.	.
1800	.	.	.	.	.	.	.	.	.	.	.	.
2400	.	.	.									



*Figure 1. Three-bladed model rotor in the Army anechoic hover chamber.*



*Figure 2. Top view of the model rotor showing the pressure transducers and a partial view of the pressure blade.*



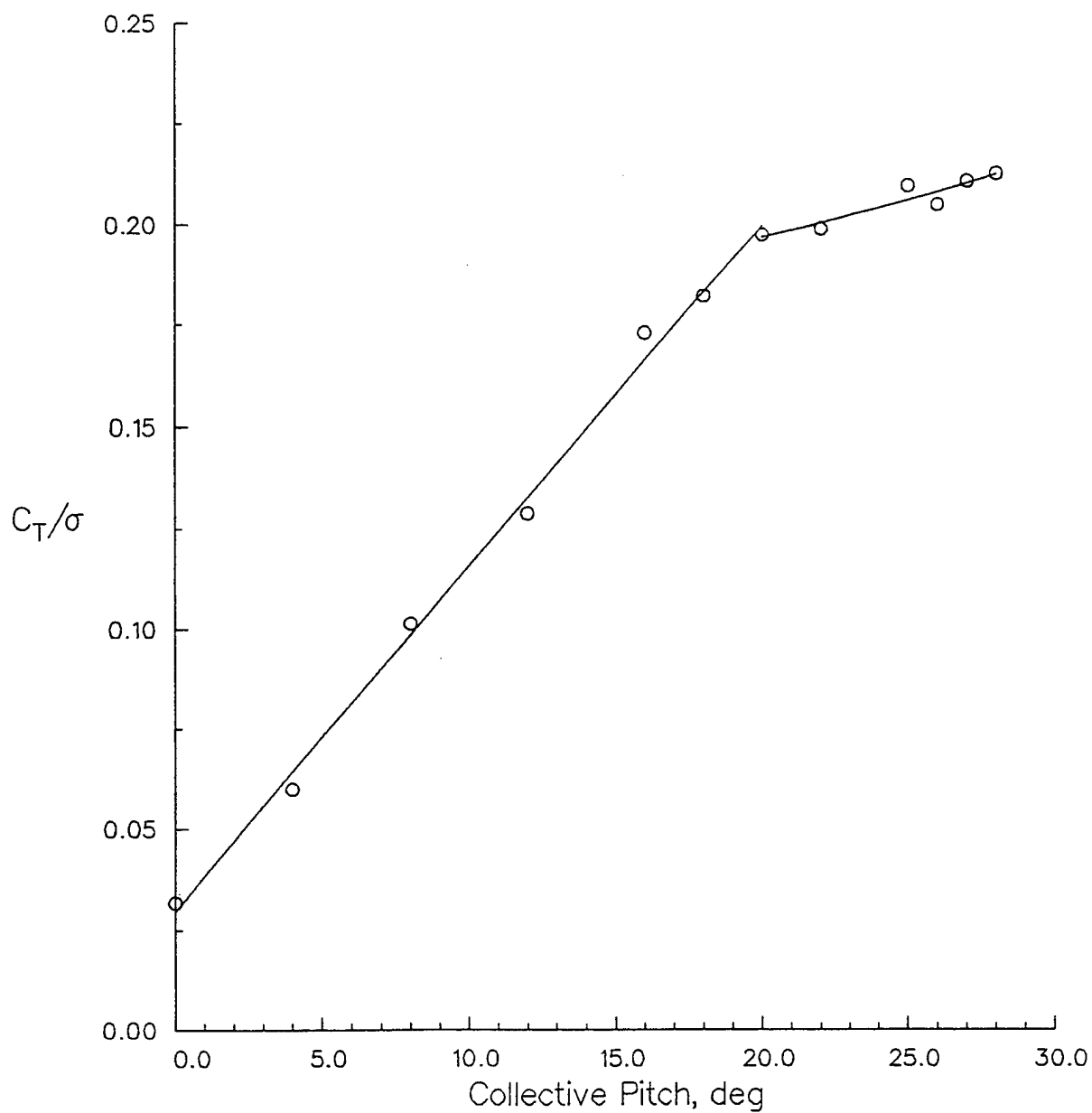


Figure 3. Effect of collective pitch on  $C_T/\sigma$  at 1800 rpm.

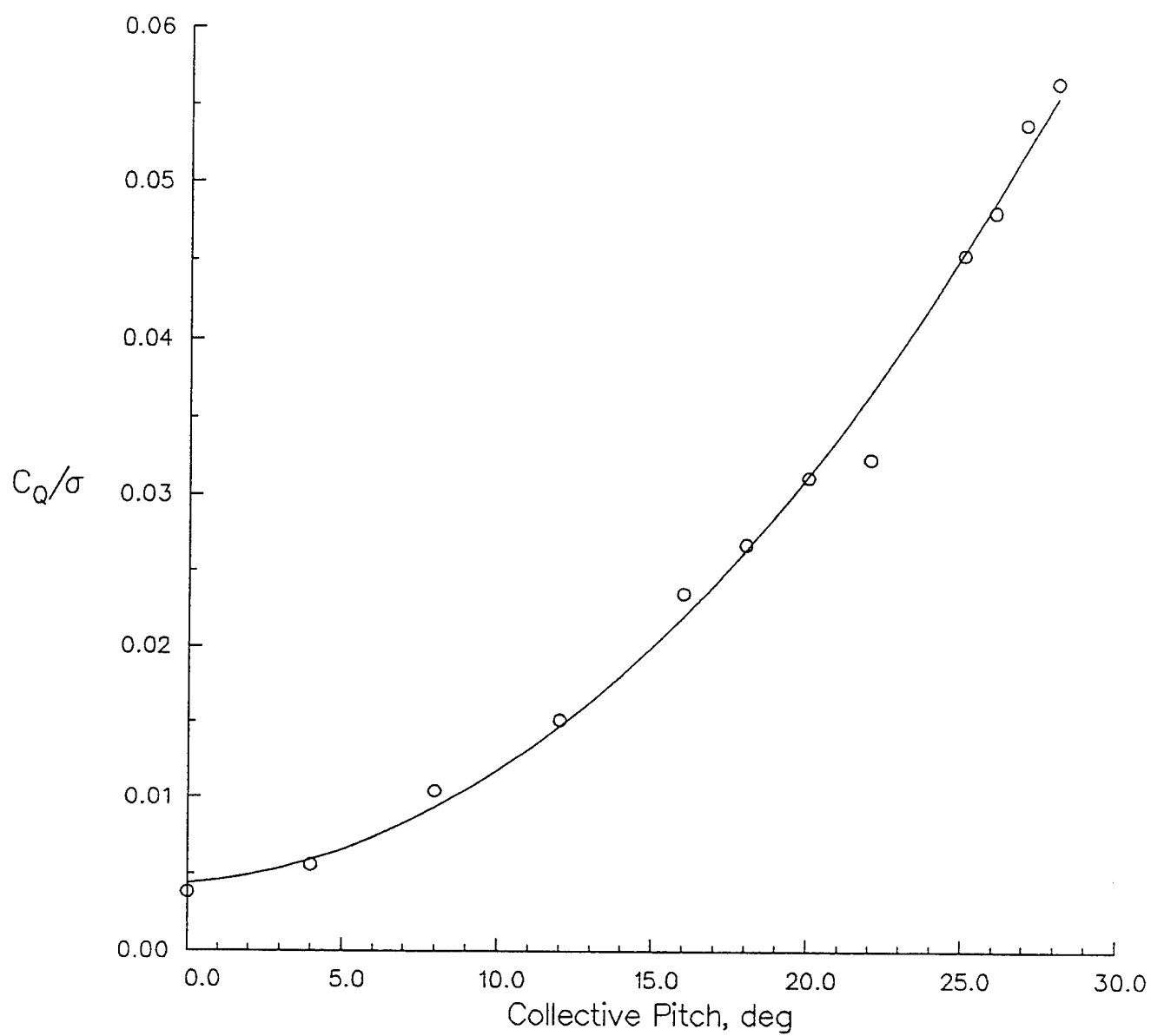


Figure 4. Effect of collective pitch on  $C_Q/\sigma$  at 1800 rpm.

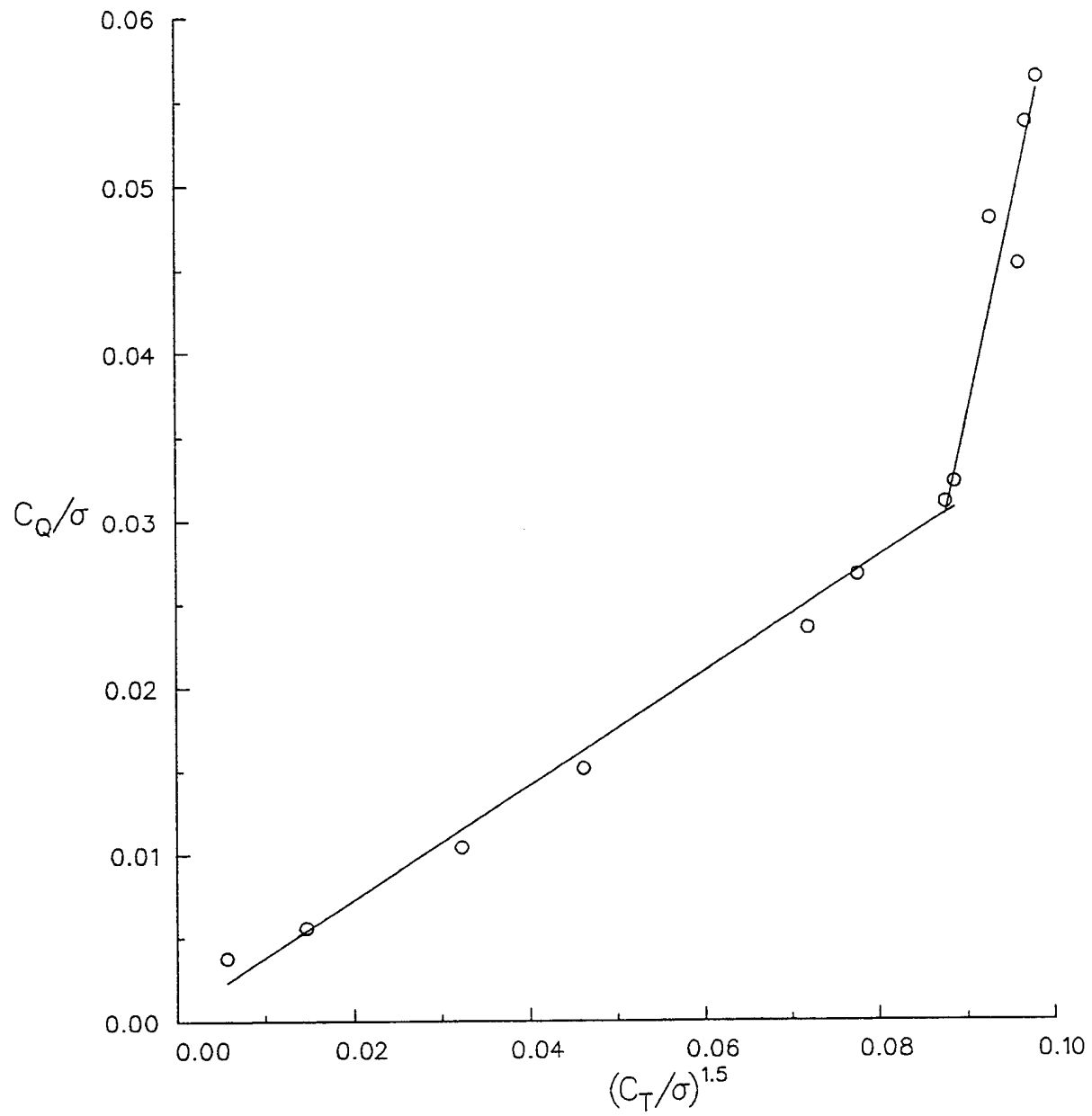


Figure 5.  $C_Q/\sigma$  as a function of  $(C_T/\sigma)^{1.5}$  at 1800 rpm.

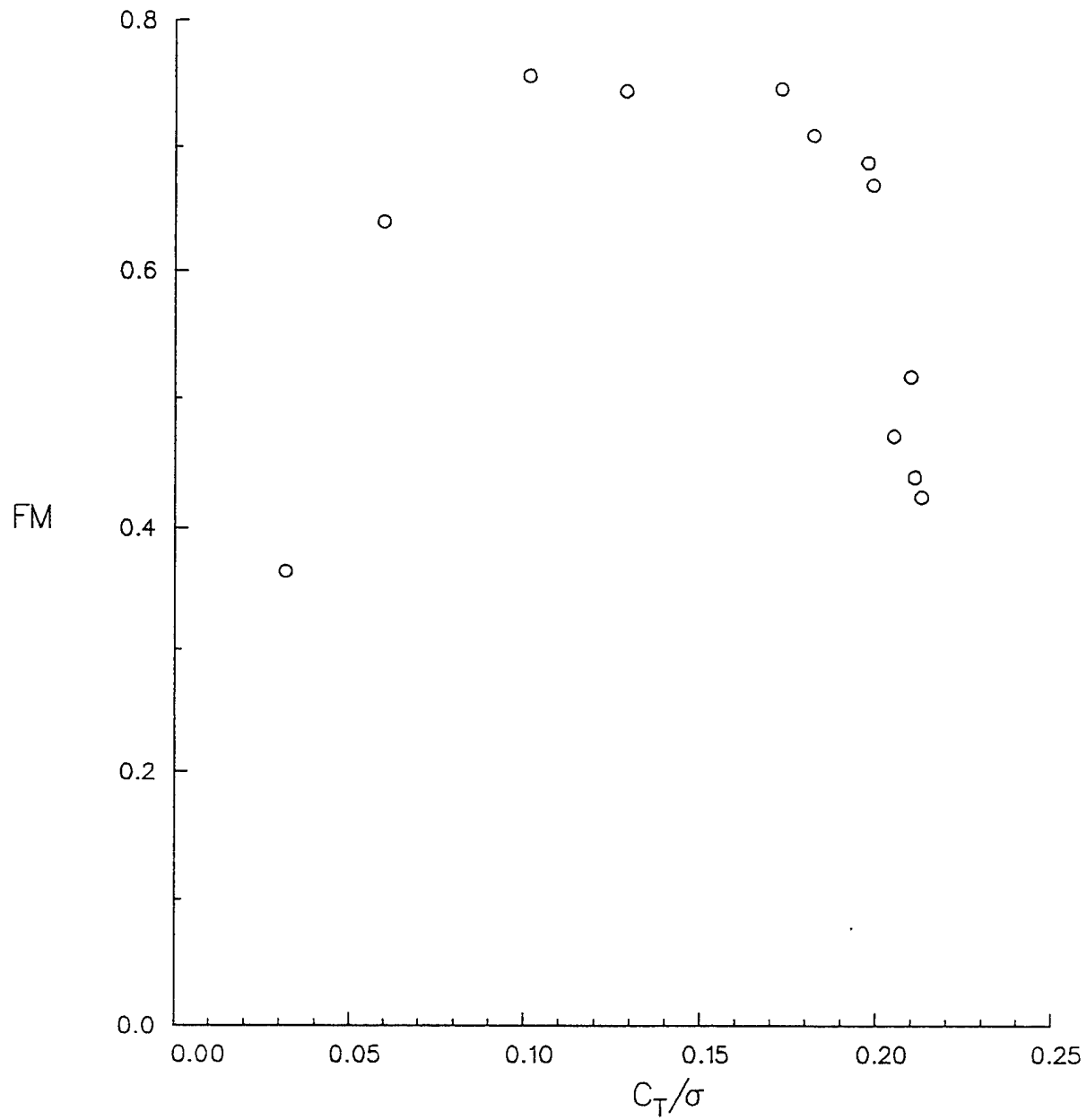


Figure 6. Effect of  $C_T/\sigma$  on rotor performance at 1800 rpm.

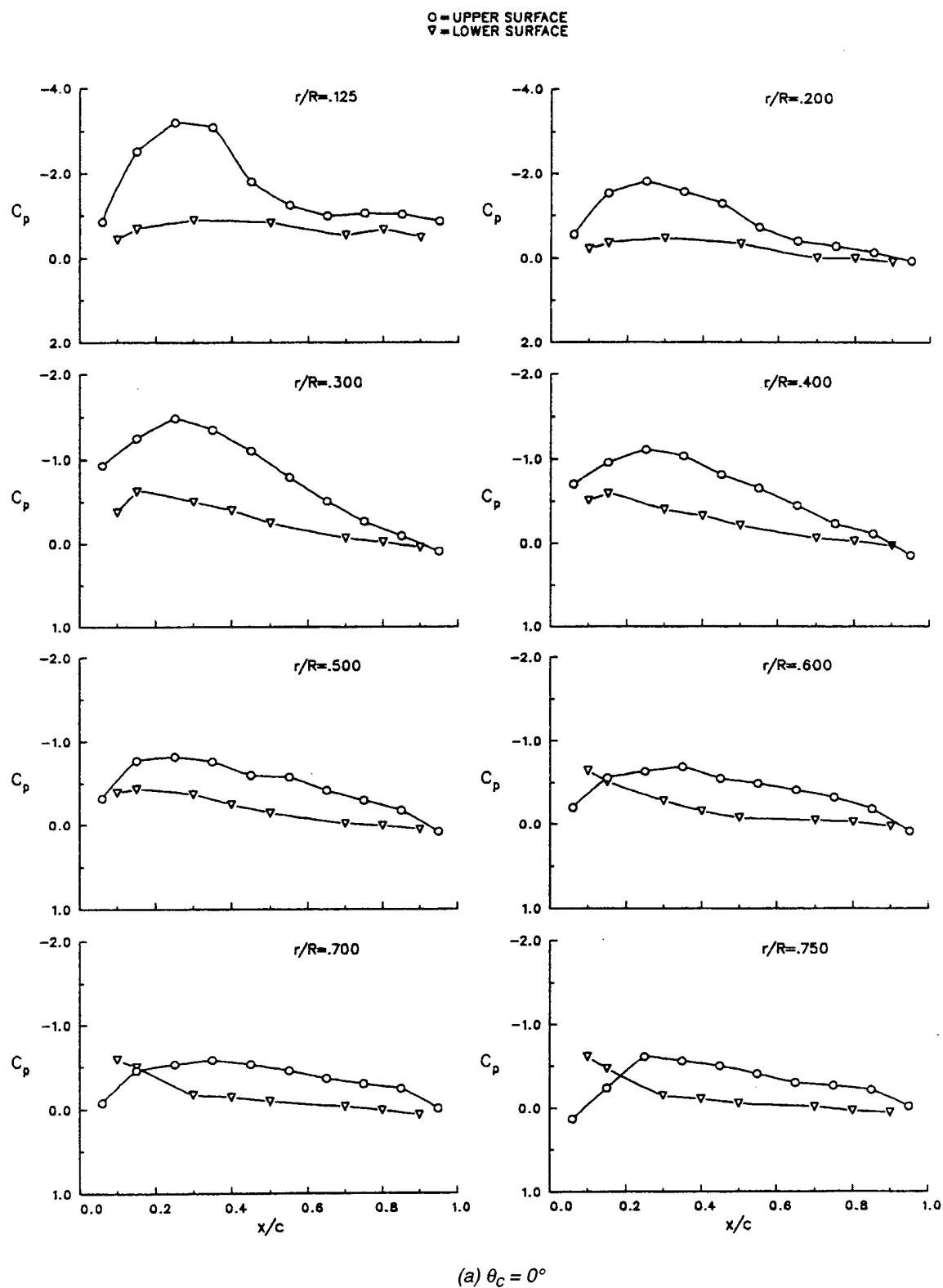
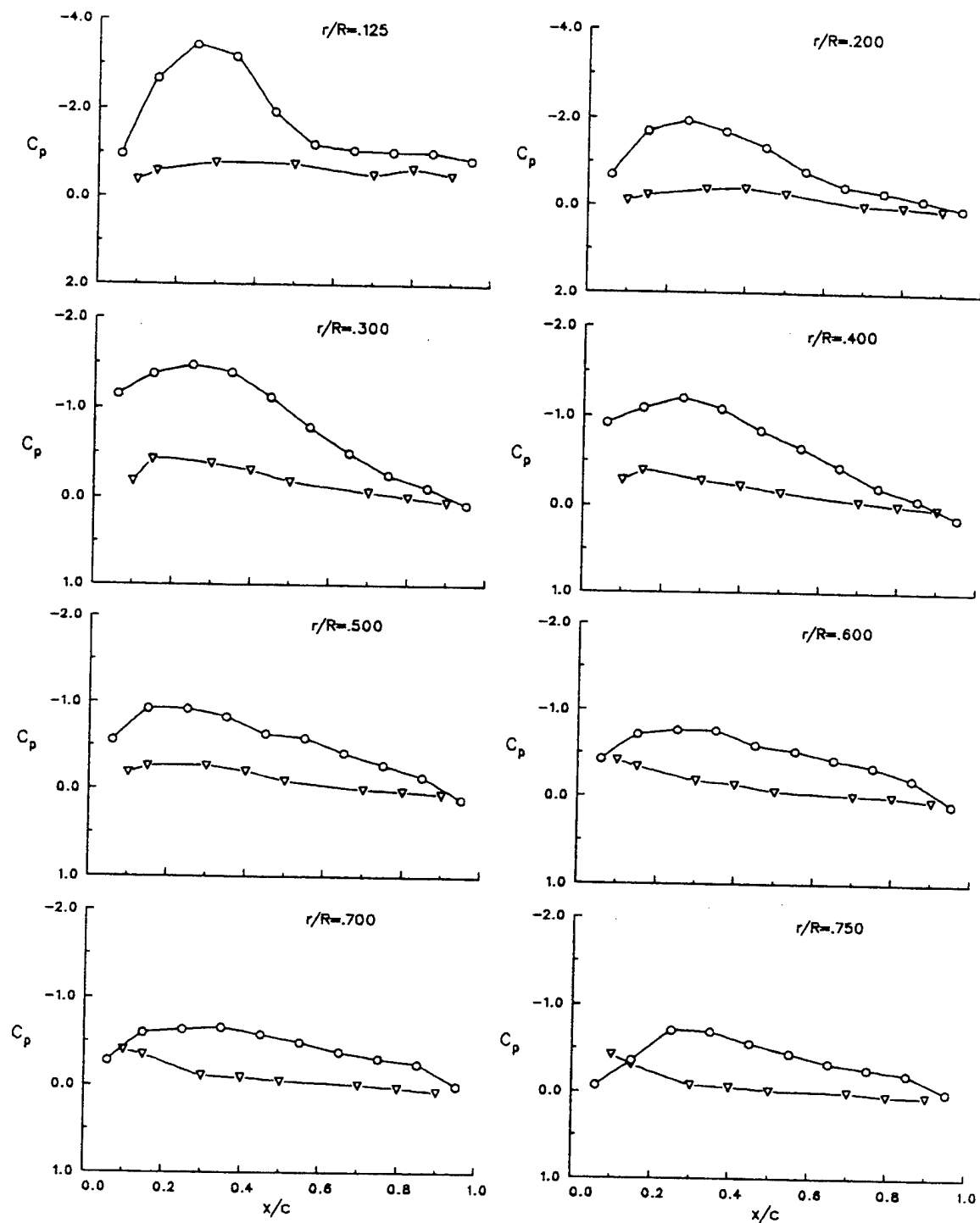


Figure 7. Chordwise pressure distributions along the blade radius; rpm = 1800. (Vertical scale changes from plot to plot.)

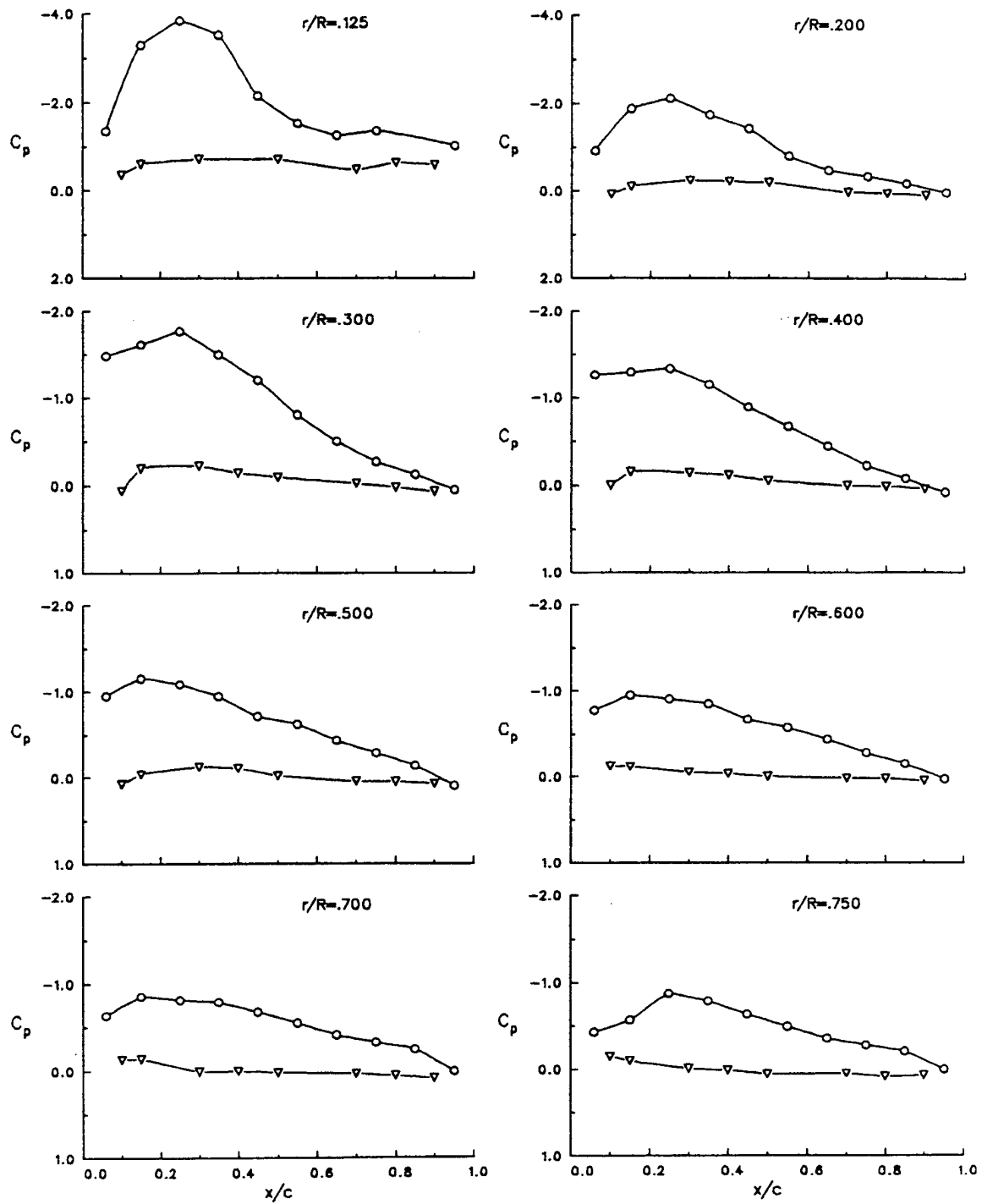
○ = UPPER SURFACE  
▽ = LOWER SURFACE



(b)  $\theta_c = 4^\circ$

Figure 7. Continued.

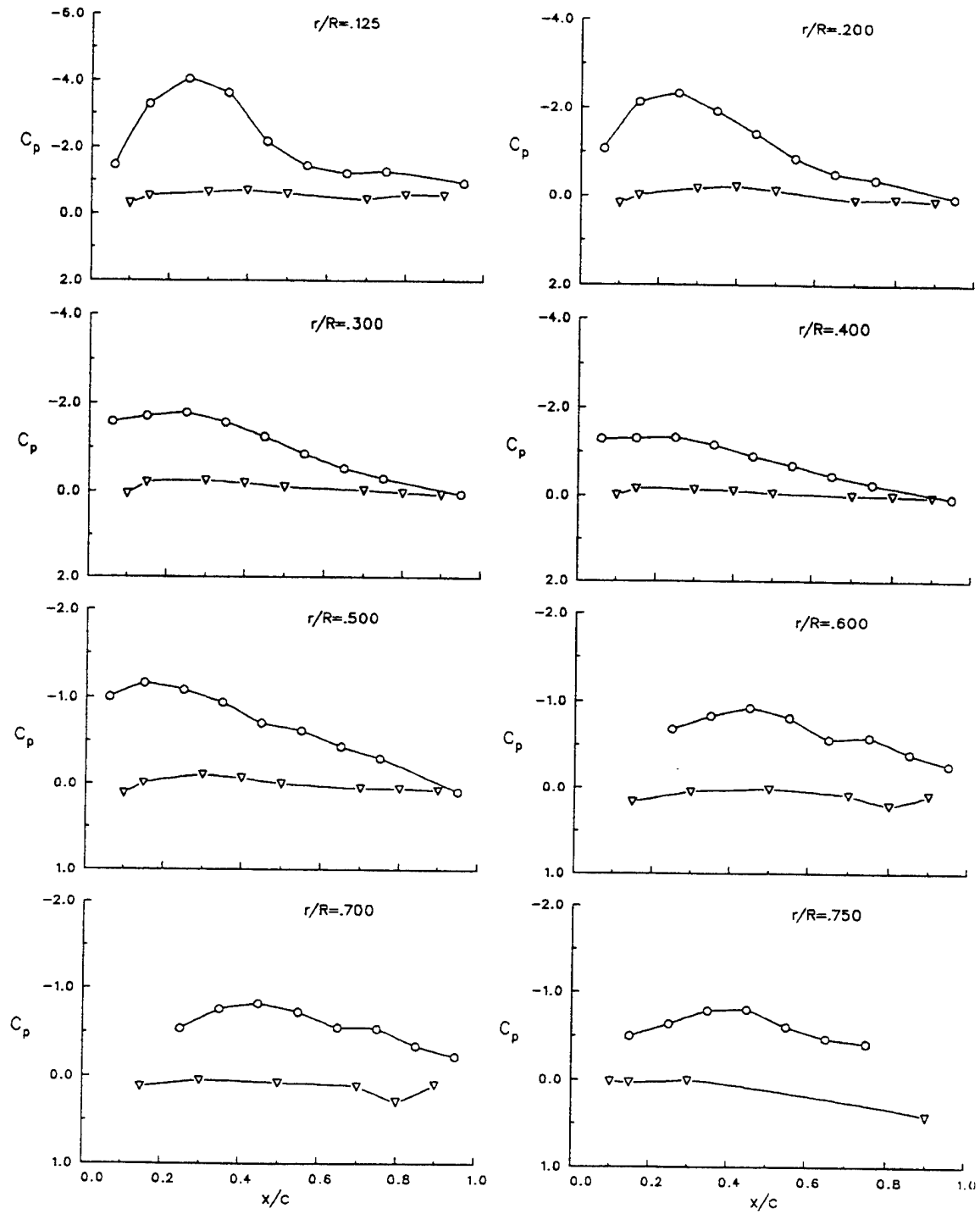
○ = UPPER SURFACE  
 ▽ = LOWER SURFACE



(c)  $\theta_c = 8^\circ$

Figure 7. Continued.

○ = UPPER SURFACE  
▽ = LOWER SURFACE

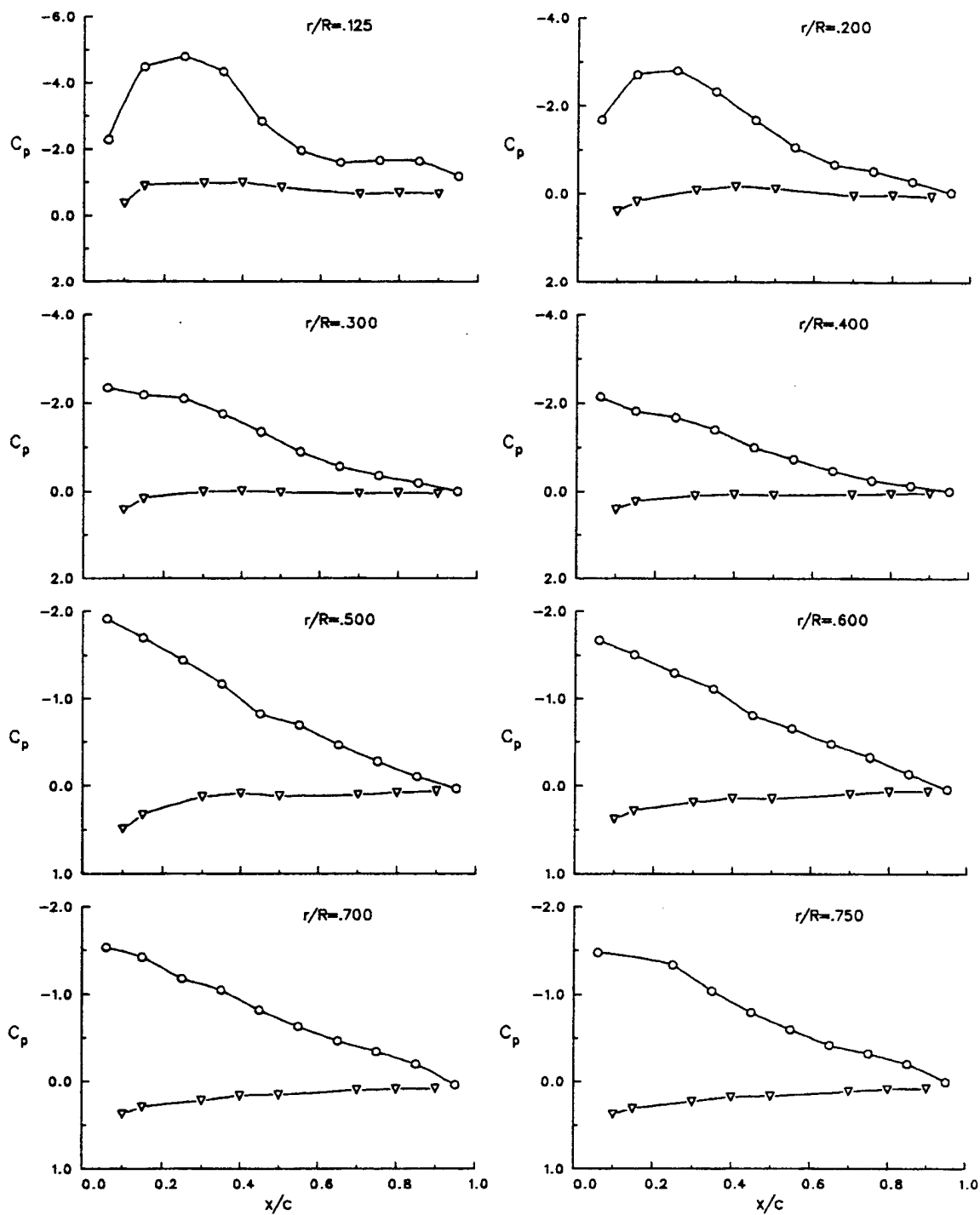


(d)  $\theta_c = 12^\circ$

Figure 7. Continued.

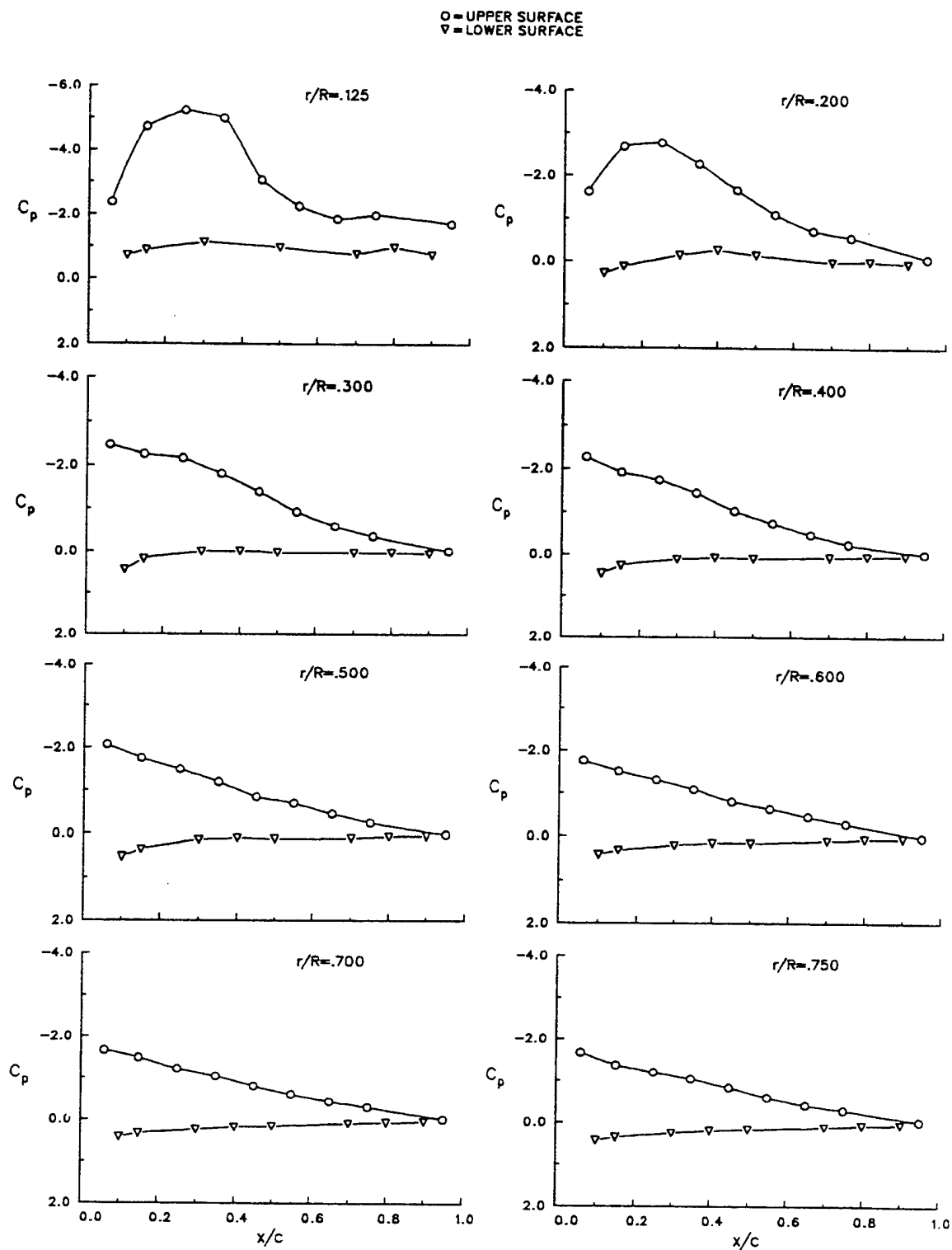


○ = UPPER SURFACE  
▽ = LOWER SURFACE



(e)  $\theta_c = 16^\circ$

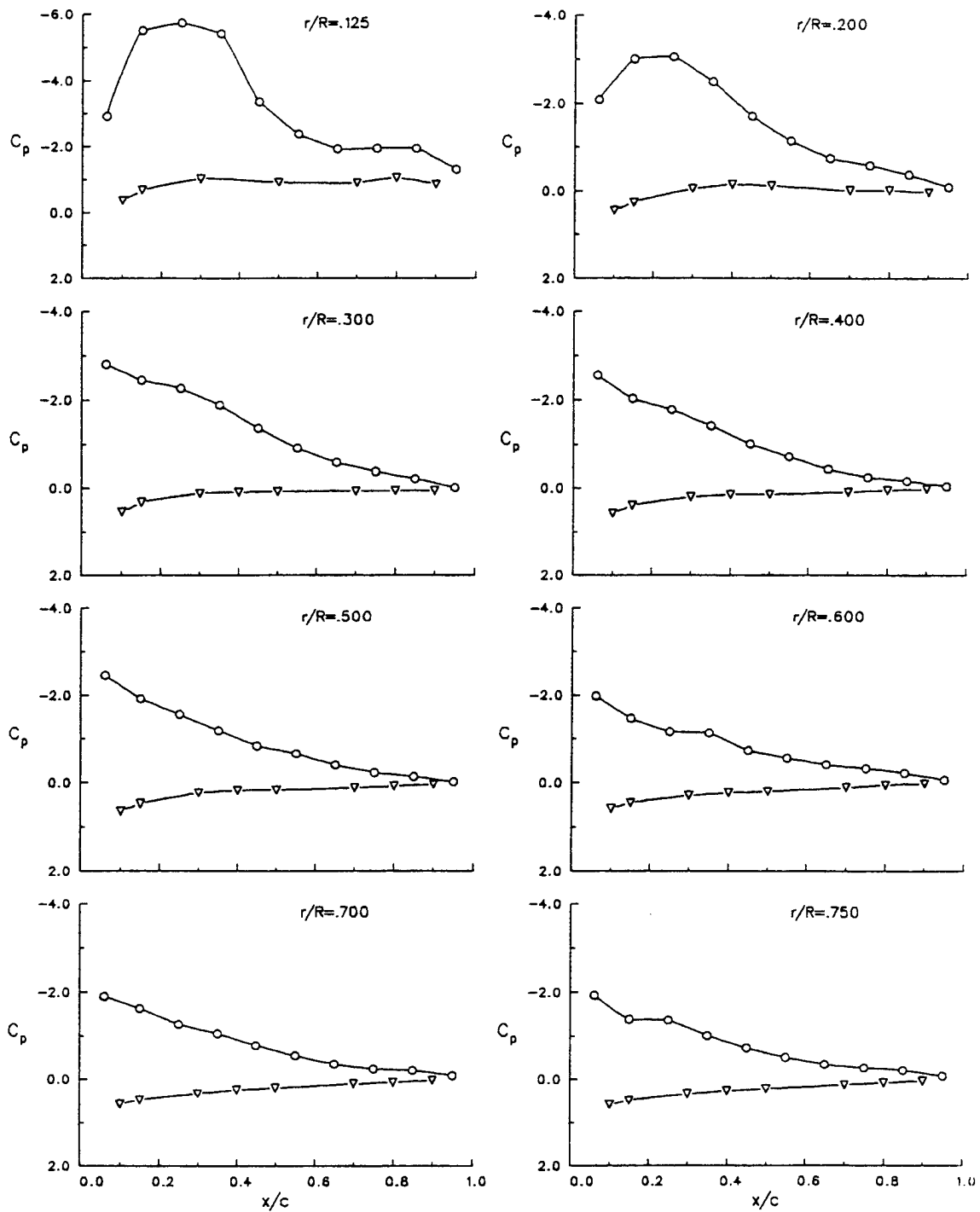
Figure 7. Continued.



(f)  $\theta_c = 18^\circ$

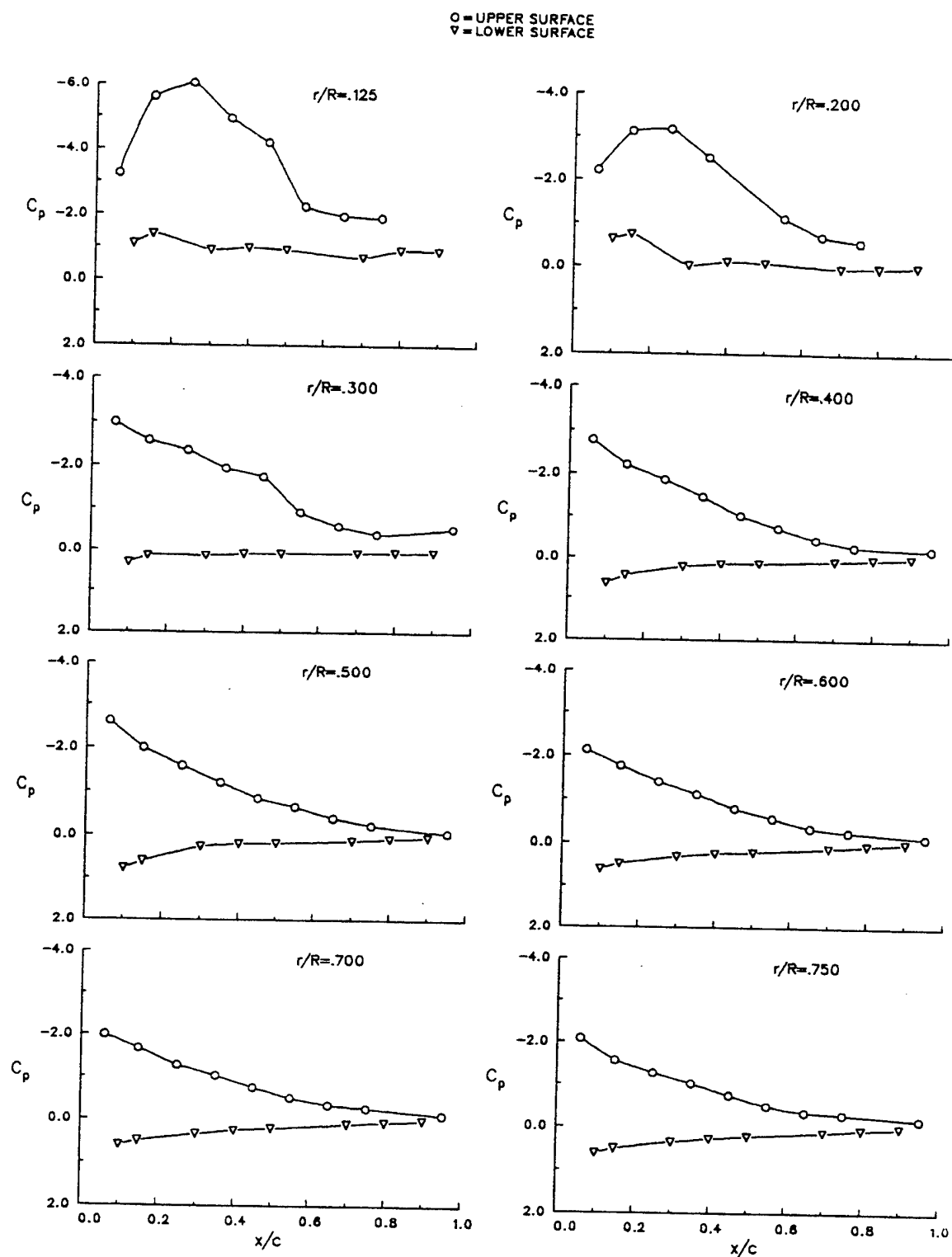
Figure 7. Continued.

○ = UPPER SURFACE  
▽ = LOWER SURFACE



(g)  $\theta_c = 20^\circ$

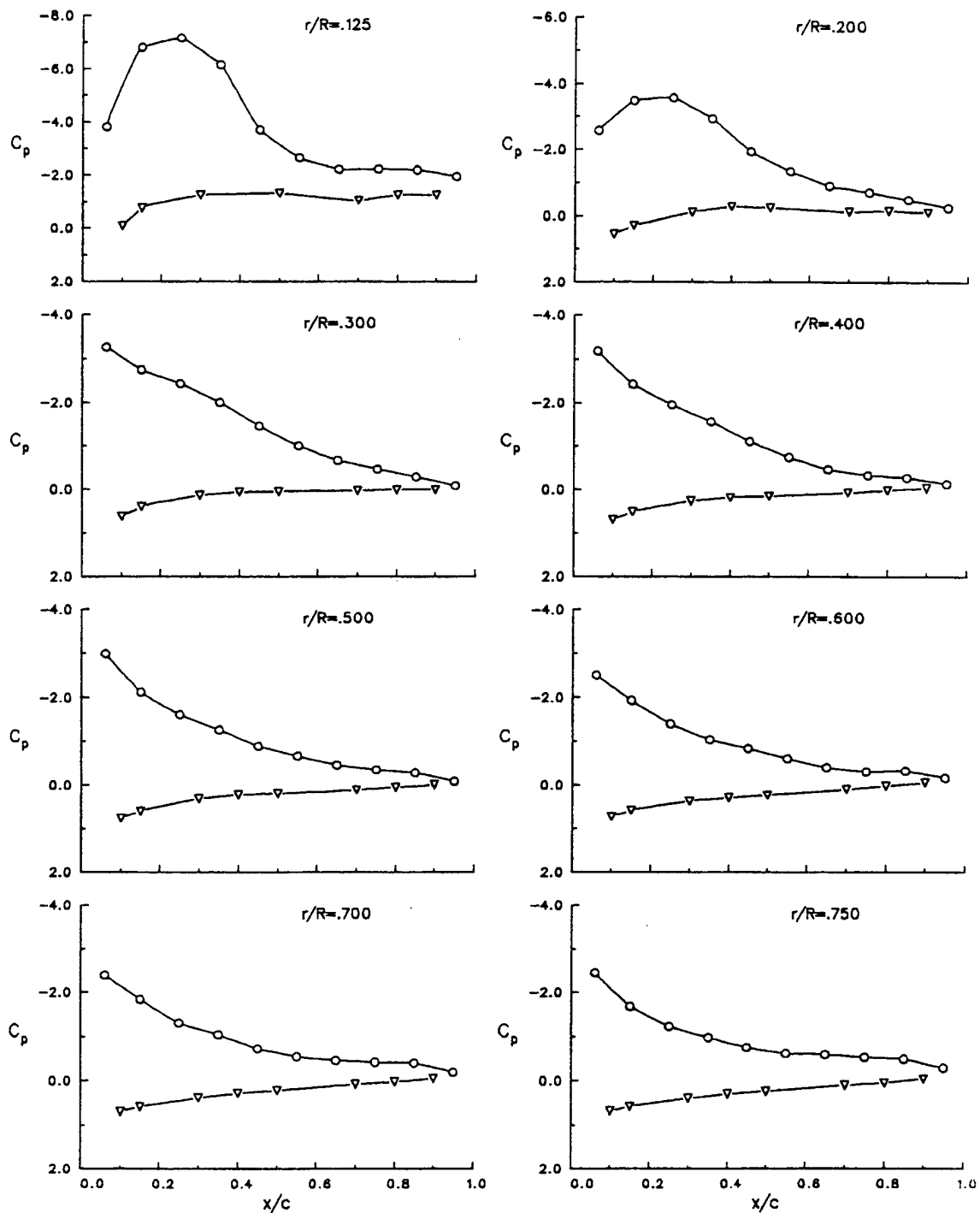
Figure 7. Continued.



(h)  $\theta_c = 22^\circ$

Figure 7. Continued.

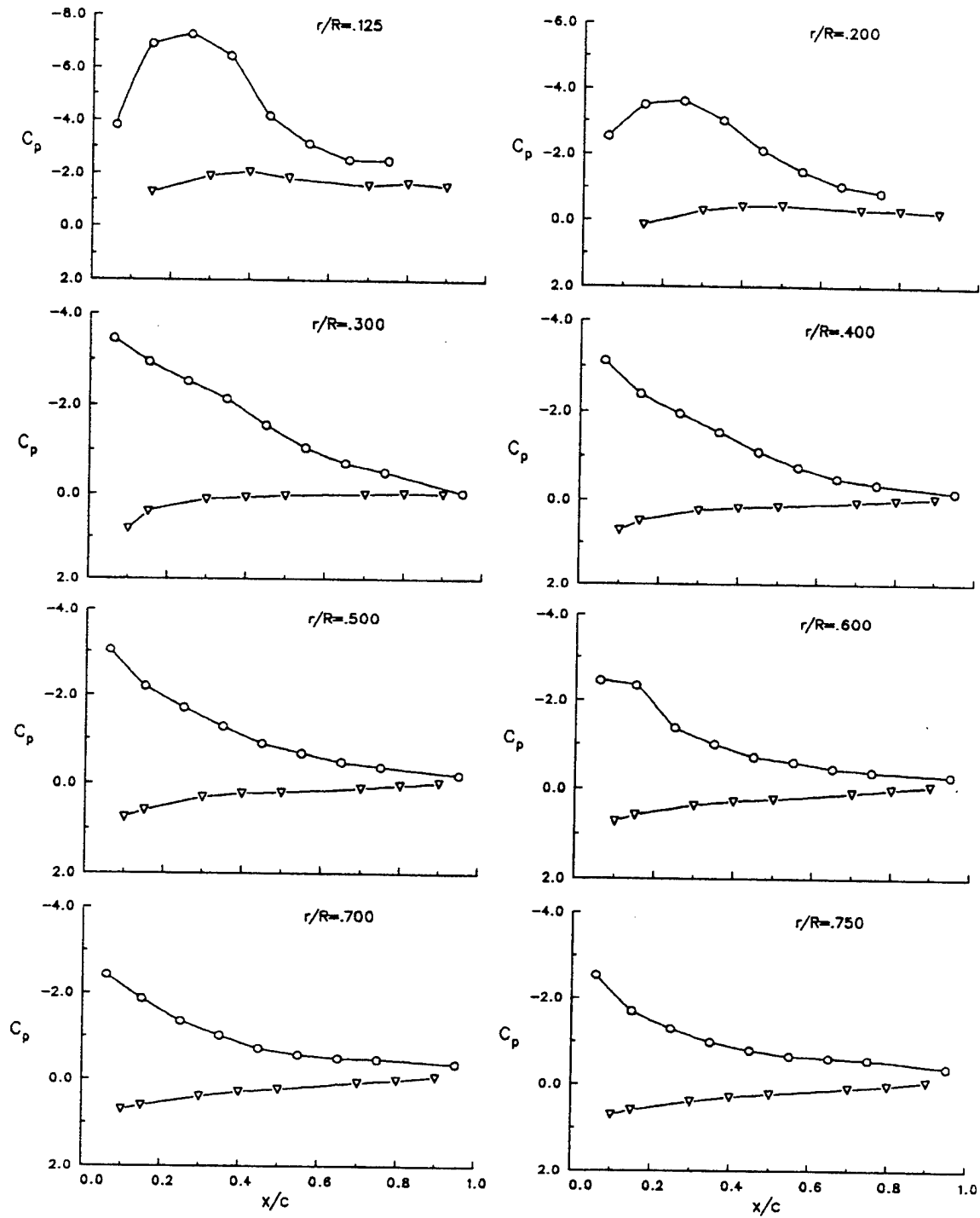
○ = UPPER SURFACE  
▽ = LOWER SURFACE



(i)  $\theta_c = 25^\circ$

Figure 7. Continued.

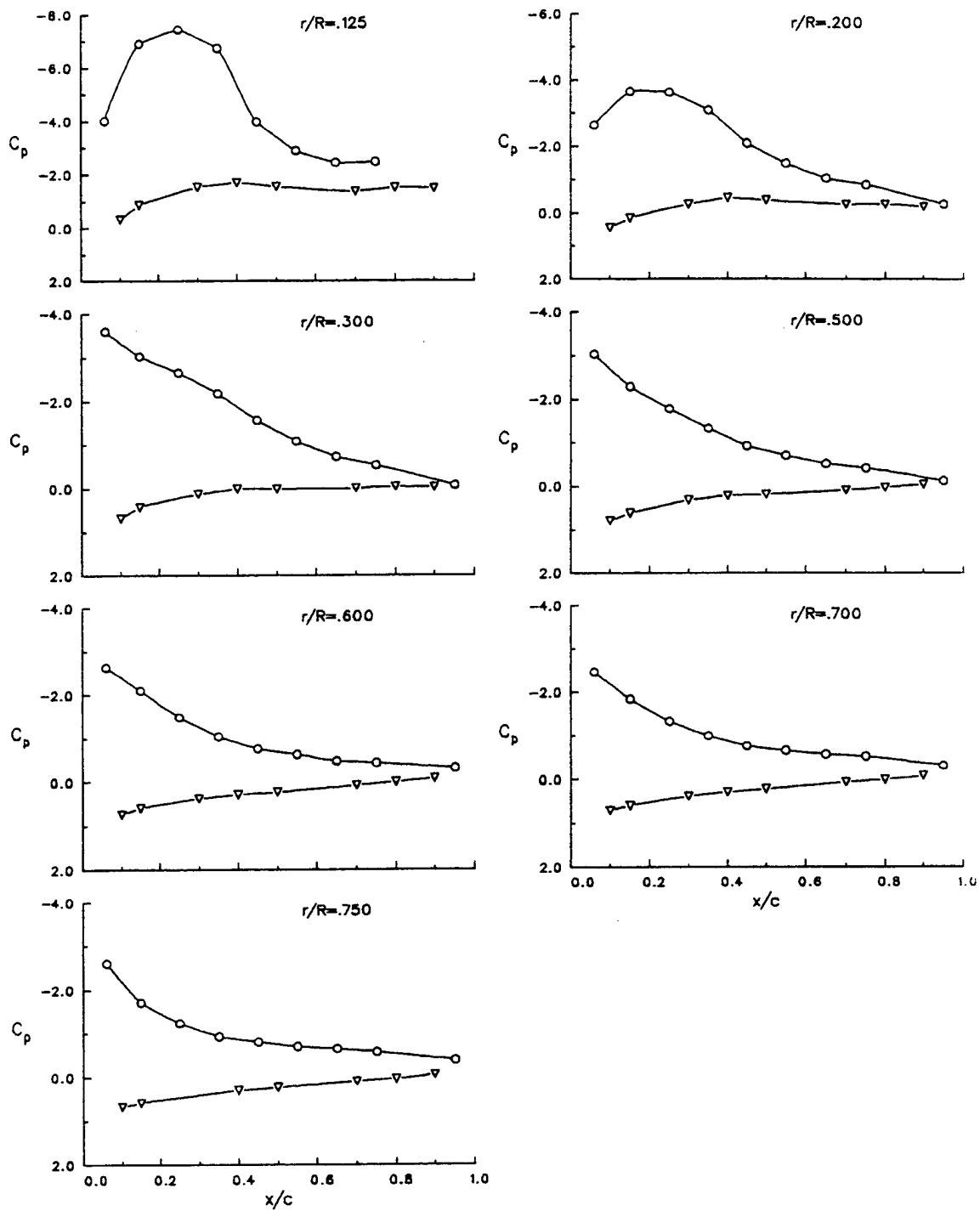
○ = UPPER SURFACE  
▽ = LOWER SURFACE



(j)  $\theta_c = 26^\circ$

Figure 7. Continued.

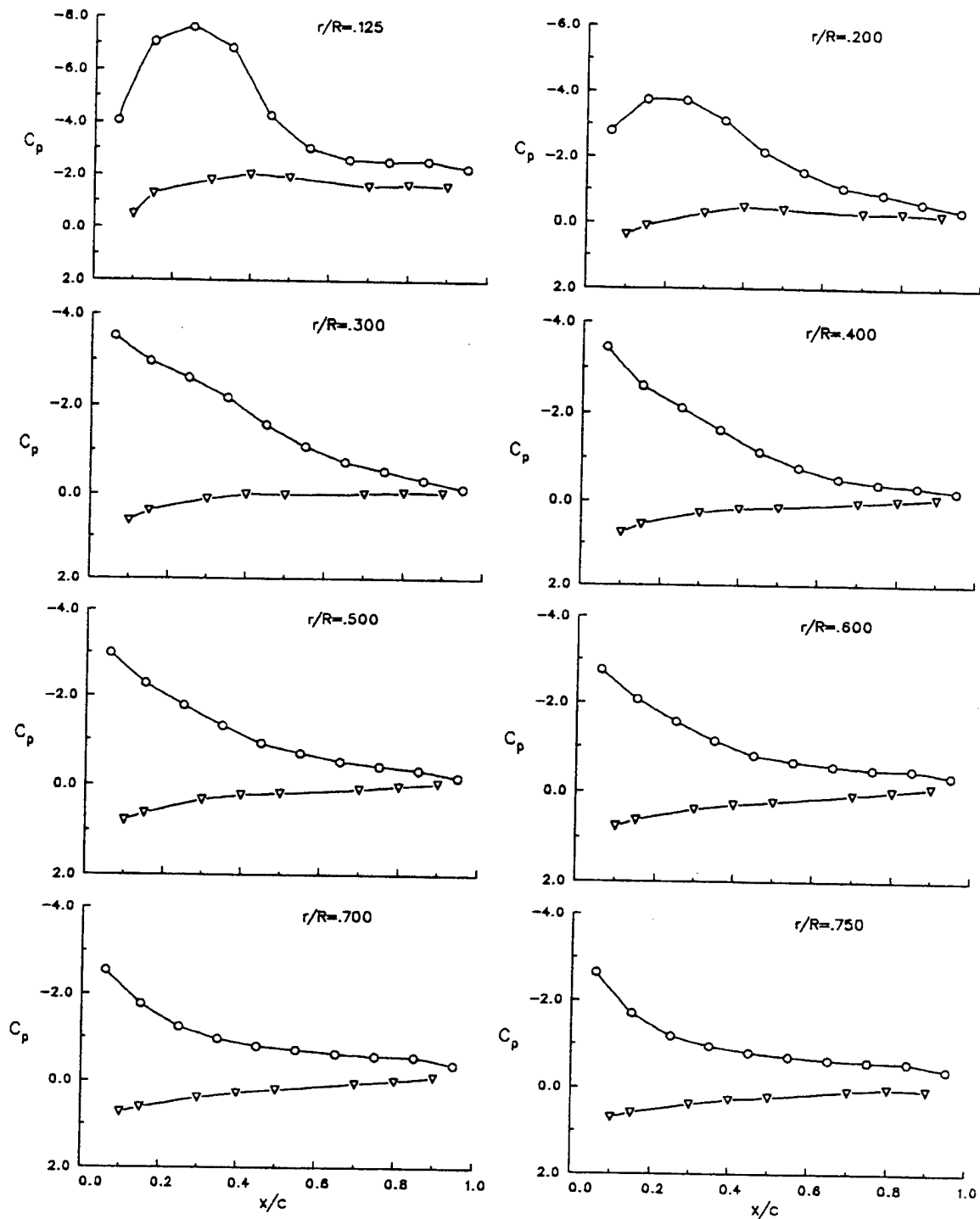
○ = UPPER SURFACE  
▽ = LOWER SURFACE



(k)  $\theta_c = 27^\circ$

Figure 7. Continued.

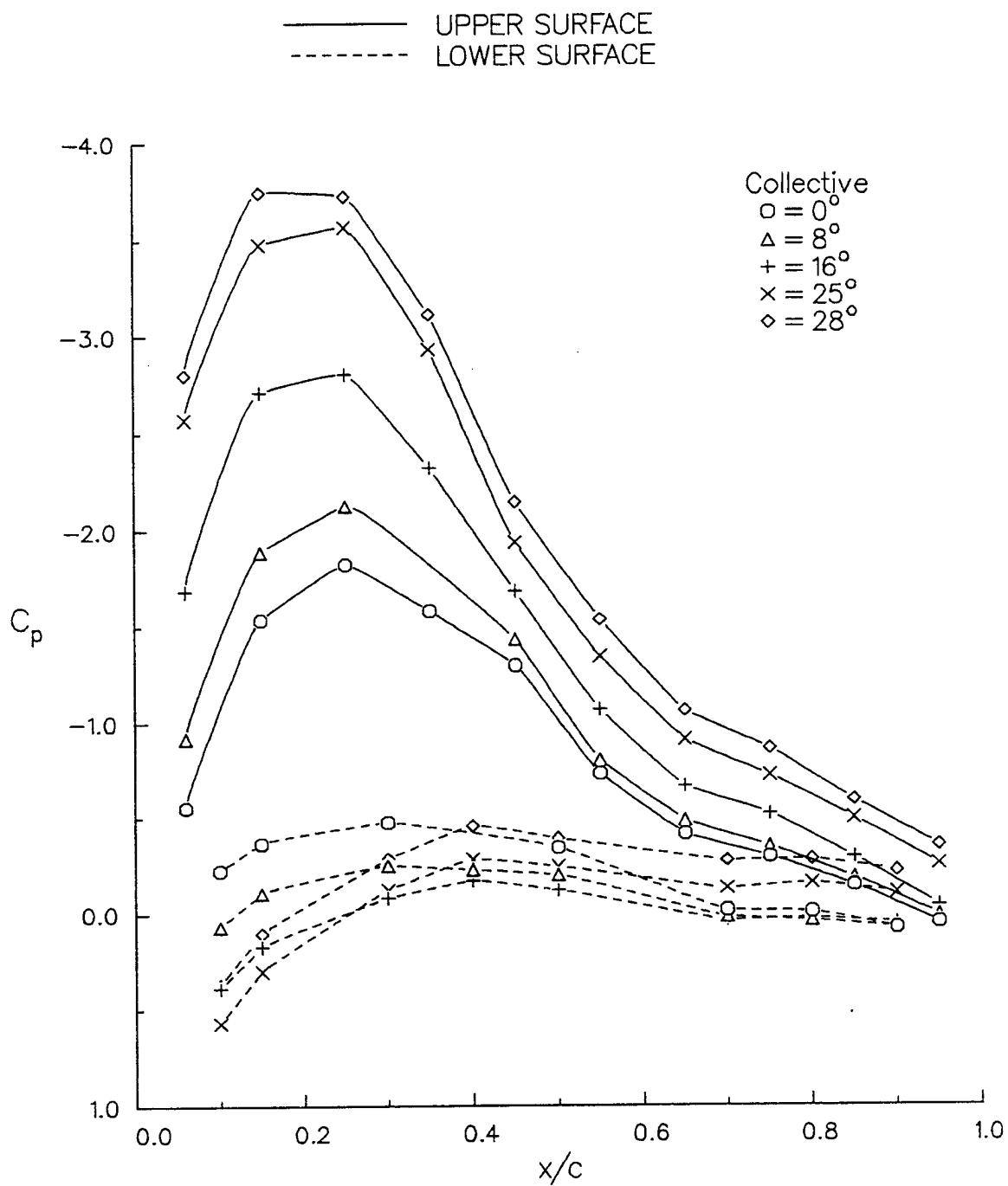
○ = UPPER SURFACE  
▽ = LOWER SURFACE



(1)  $\theta_c = 28^\circ$

Figure 7. Concluded.





(a)  $r/R = 0.20$

Figure 8. Surface pressure distributions for a range of collective pitch angles; rpm = 1800.

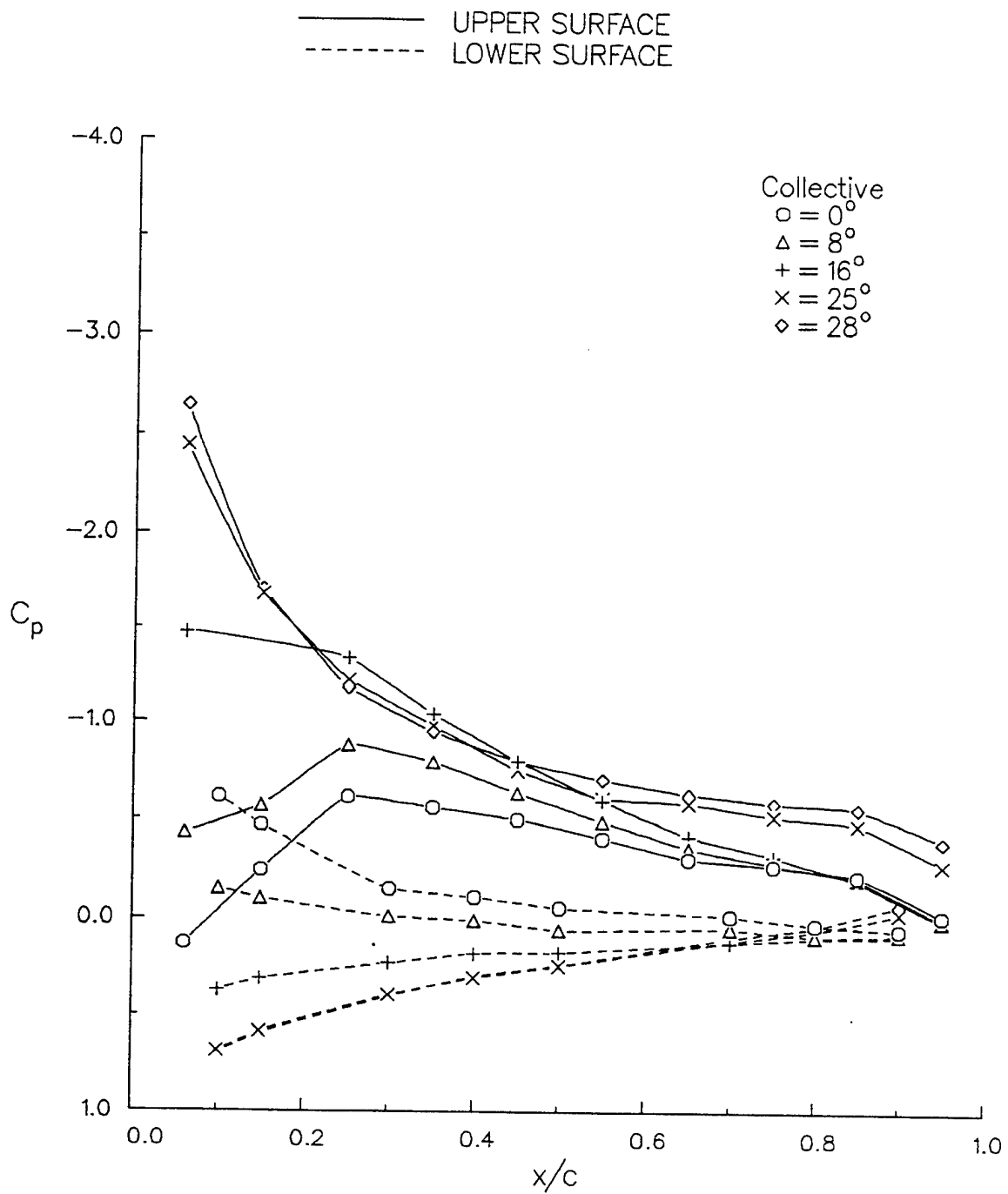
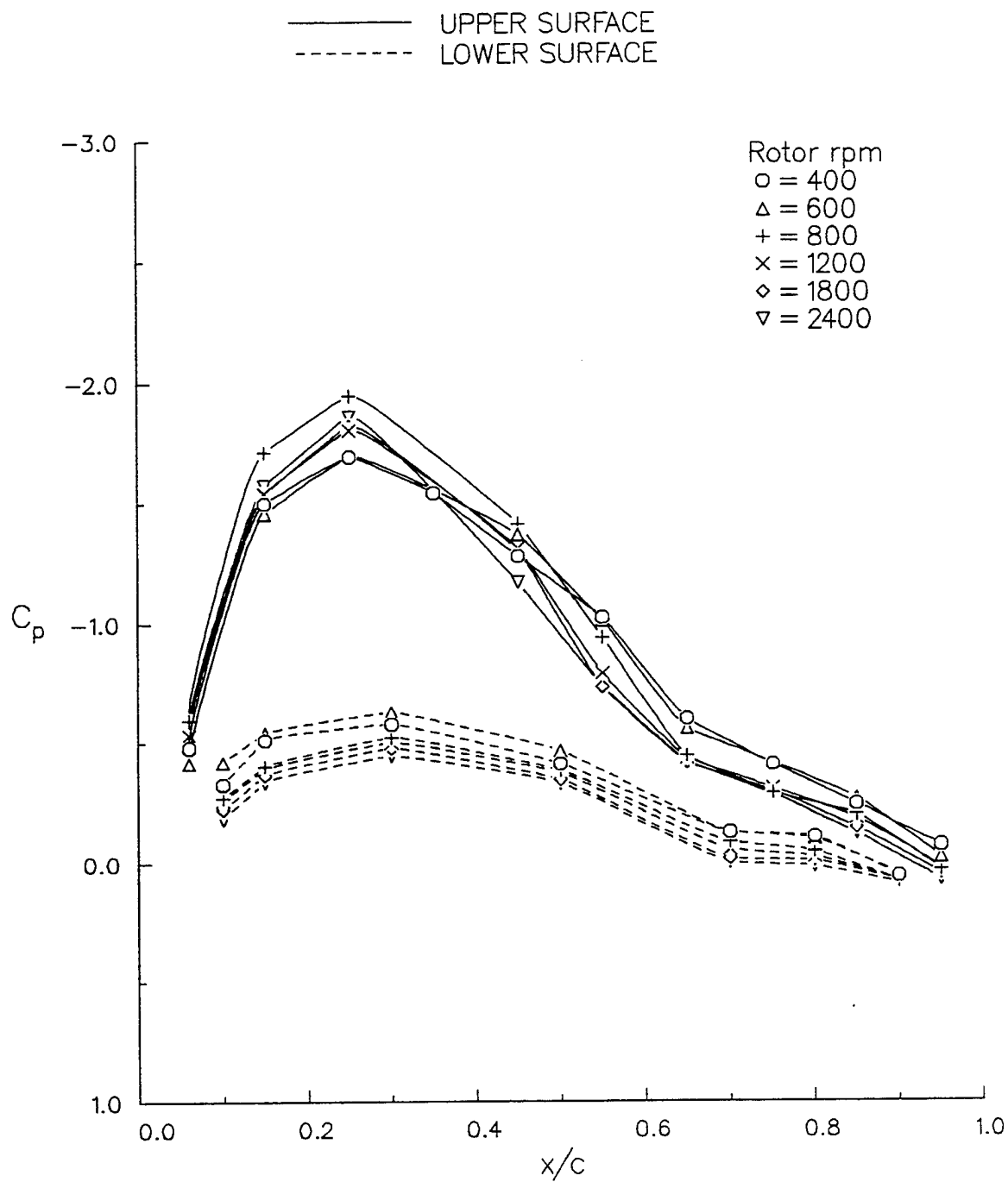
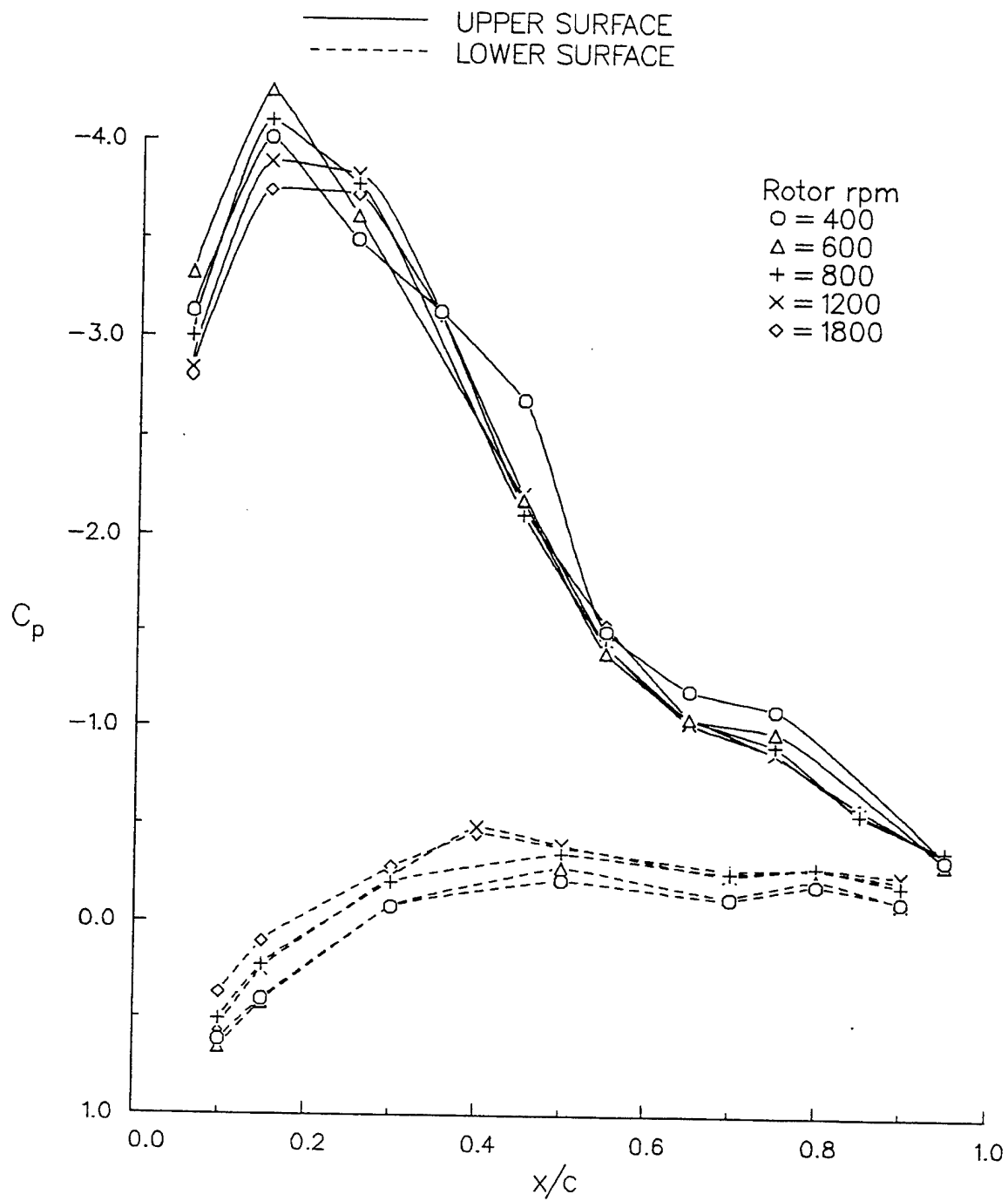


Figure 8. Concluded.



(a)  $\theta_c = 0^\circ$

Figure 9. Surface pressure distributions for a range of rotor speeds;  $r/R = 0.20$ .



(b)  $\theta_c = 28^\circ$

Figure 9. Concluded.

## **Appendix A**

### **Pressure Blade Airfoil Coordinates**

r/R = 0.155			
x/c	y/c	x/c	y/c
1.0000	0.0059	0.0124	-0.0660
0.9974	0.0114	0.0161	-0.0725
0.9911	0.0167	0.0258	-0.0861
0.9764	0.0250	0.0379	-0.0998
0.9423	0.0424	0.0516	-0.1133
0.8857	0.0674	0.0706	-0.1296
0.8495	0.0827	0.0902	-0.1439
0.7881	0.1069	0.1101	-0.1567
0.7415	0.1250	0.1335	-0.1691
0.6922	0.1432	0.1560	-0.1798
0.6381	0.1626	0.1997	-0.1949
0.5878	0.1801	0.2174	-0.1994
0.5434	0.1945	0.2405	-0.2041
0.4907	0.2119	0.2628	-0.2071
0.4414	0.2258	0.2762	-0.2087
0.3915	0.2376	0.2983	-0.2108
0.3399	0.2457	0.3449	-0.2125
0.2895	0.2474	0.3984	-0.2116
0.2424	0.2406	0.4542	-0.2066
0.1913	0.2246	0.5548	-0.1854
0.1416	0.1991	0.5988	-0.1725
0.0946	0.1641	0.6524	-0.1548
0.0533	0.1193	0.6961	-0.1397
0.0423	0.1043	0.7460	-0.1214
0.0385	0.0986	0.7986	-0.1017
0.0215	0.0702	0.8475	-0.0822
0.0081	0.0380	0.8935	-0.0631
0.0020	0.0130	0.9409	-0.0413
0.0000	-0.0122	0.9767	-0.0216
0.0010	-0.0281	0.9942	-0.0057
0.0041	-0.0447	0.9973	-0.0023
0.0073	-0.0547	1.0000	0.0059
0.0117	-0.0647		

r/R = 0.206			
x/c	y/c	x/c	y/c
1.0000	0.0007	0.0114	-0.0485
0.9904	0.0151	0.0194	-0.0595
0.9797	0.0206	0.0318	-0.0732
0.9712	0.0273	0.0526	-0.0905
0.9341	0.0488	0.0811	-0.1084
0.8928	0.0701	0.1067	-0.1206
0.8427	0.0940	0.1186	-0.1253
0.7931	0.1158	0.1454	-0.1345
0.7433	0.1364	0.1878	-0.1455
0.6966	0.1545	0.2261	-0.1533
0.6398	0.1752	0.2566	-0.1583
0.5928	0.1909	0.2937	-0.1626
0.5477	0.2044	0.3418	-0.1663
0.4972	0.2174	0.3929	-0.1672
0.4469	0.2280	0.4415	-0.1650
0.3901	0.2361	0.4971	-0.1591
0.3455	0.2394	0.5393	-0.1521
0.2917	0.2387	0.5929	-0.1409
0.2434	0.2329	0.6392	-0.1294
0.1902	0.2189	0.6867	-0.1168
0.1454	0.1998	0.7361	-0.1028
0.0941	0.1665	0.7947	-0.0864
0.0575	0.1305	0.8430	-0.0718
0.0407	0.1095	0.8905	-0.0570
0.0338	0.0996	0.9196	-0.0470
0.0165	0.0685	0.9503	-0.0355
0.0094	0.0506	0.9815	-0.0216
0.0017	0.0193	0.9859	-0.0172
0.0000	-0.0072	0.9918	-0.0114
0.0020	-0.0228	0.9996	-0.0062
0.0097	-0.0446	1.0000	0.0007

$r/R = 0.306$			
x/c	y/c	x/c	y/c
1.0000	-0.0025	0.0265	-0.0525
0.9942	0.0054	0.0433	-0.0680
0.9824	0.0114	0.0525	-0.0753
0.9691	0.0190	0.0704	-0.0873
0.9482	0.0304	0.0898	-0.0979
0.9188	0.0451	0.0991	-0.1023
0.8755	0.0648	0.1194	-0.1102
0.8256	0.0858	0.1409	-0.1173
0.7808	0.1033	0.1616	-0.1221
0.7296	0.1220	0.1723	-0.1240
0.6785	0.1394	0.1884	-0.1264
0.6295	0.1545	0.2218	-0.1294
0.5773	0.1684	0.2888	-0.1305
0.5380	0.1777	0.3477	-0.1282
0.4814	0.1890	0.3875	-0.1256
0.4360	0.1958	0.4367	-0.1210
0.3879	0.1998	0.4907	-0.1151
0.3385	0.2009	0.5377	-0.1089
0.2885	0.1969	0.5808	-0.1025
0.2399	0.1901	0.6293	-0.0943
0.1867	0.1768	0.6810	-0.0851
0.1426	0.1607	0.7264	-0.0765
0.0992	0.1394	0.7763	-0.0670
0.0576	0.1101	0.8250	-0.0568
0.0314	0.0829	0.8730	-0.0464
0.0241	0.0727	0.9089	-0.0378
0.0104	0.0477	0.9517	-0.0265
0.0029	0.0259	0.9779	-0.0173
0.0004	0.0034	0.9886	-0.0127
0.0070	-0.0259	1.0000	-0.0025
0.0076	-0.0276		

$r/R = 0.405$			
x/c	y/c	x/c	y/c
1.0000	0.0180	0.0161	-0.0194
0.9854	0.0258	0.0307	-0.0332
0.9549	0.0430	0.0476	-0.0454
0.9105	0.0629	0.0693	-0.0576
0.8540	0.0837	0.0753	-0.0606
0.8062	0.0986	0.0956	-0.0688
0.7542	0.1133	0.1190	-0.0758
0.6968	0.1284	0.1468	-0.0818
0.6523	0.1390	0.1930	-0.0873
0.5999	0.1499	0.2458	-0.0904
0.5510	0.1586	0.3018	-0.0912
0.5044	0.1652	0.3471	-0.0902
0.4472	0.1714	0.3963	-0.0883
0.3941	0.1747	0.4452	-0.0850
0.3443	0.1753	0.4960	-0.0809
0.2989	0.1732	0.5482	-0.0756
0.2488	0.1675	0.5956	-0.0708
0.1951	0.1559	0.6500	-0.0643
0.1468	0.1419	0.6959	-0.0584
0.1025	0.1241	0.7544	-0.0501
0.0590	0.1000	0.7986	-0.0436
0.0406	0.0858	0.8453	-0.0360
0.0363	0.0819	0.8995	-0.0267
0.0265	0.0719	0.9250	-0.0217
0.0174	0.0609	0.9613	-0.0138
0.0081	0.0457	0.9819	-0.0080
0.0032	0.0334	0.9967	0.0006
0.0004	0.0183	1.0012	0.0051
0.0014	0.0069	1.0000	0.0180
0.0066	-0.0065		

$r/R = 0.506$			
x/c	y/c	x/c	y/c
1.0000	0.0024	0.0109	-0.0128
0.9955	0.0101	0.0302	-0.0275
0.9845	0.0156	0.0619	-0.0424
0.9517	0.0291	0.0683	-0.0448
0.9050	0.0450	0.0899	-0.0515
0.8547	0.0607	0.1152	-0.0577
0.8068	0.0737	0.1444	-0.0631
0.7525	0.0875	0.1860	-0.0684
0.7033	0.0984	0.2410	-0.0720
0.6532	0.1083	0.2931	-0.0734
0.6078	0.1161	0.3499	-0.0722
0.5471	0.1246	0.4019	-0.0697
0.4974	0.1296	0.4499	-0.0663
0.4480	0.1332	0.5005	-0.0628
0.3981	0.1360	0.5488	-0.0588
0.3497	0.1372	0.6039	-0.0543
0.2952	0.1354	0.6431	-0.0506
0.2453	0.1305	0.7006	-0.0453
0.1943	0.1216	0.7501	-0.0406
0.1491	0.1102	0.8013	-0.0355
0.0997	0.0920	0.8433	-0.0311
0.0537	0.0690	0.9010	-0.0247
0.0350	0.0565	0.9326	-0.0208
0.0154	0.0393	0.9639	-0.0156
0.0049	0.0255	0.9841	-0.0095
0.0000	0.0102	0.9930	-0.0070
0.0012	0.0018	1.0000	0.0024

$r/R = 0.606$			
x/c	y/c	x/c	y/c
1.0000	0.0018	0.0098	-0.0284
0.9956	0.0112	0.0229	-0.0399
0.9813	0.0171	0.0364	-0.0482
0.9448	0.0307	0.0555	-0.0565
0.8976	0.0454	0.0962	-0.0669
0.8477	0.0594	0.1202	-0.0699
0.7970	0.0719	0.1451	-0.0718
0.7480	0.0825	0.1934	-0.0737
0.6912	0.0925	0.2500	-0.0735
0.6460	0.0993	0.2844	-0.0726
0.5956	0.1054	0.3479	-0.0704
0.5356	0.1111	0.3930	-0.0683
0.4900	0.1141	0.4464	-0.0654
0.4488	0.1160	0.4981	-0.0623
0.3941	0.1169	0.5401	-0.0595
0.3437	0.1157	0.5925	-0.0557
0.2890	0.1113	0.6449	-0.0514
0.2394	0.1052	0.6920	-0.0477
0.1897	0.0959	0.7383	-0.0436
0.1477	0.0854	0.7945	-0.0383
0.1044	0.0700	0.8516	-0.0321
0.0619	0.0506	0.8951	-0.0273
0.0391	0.0375	0.9237	-0.0236
0.0176	0.0217	0.9532	-0.0193
0.0037	0.0058	0.9774	-0.0143
0.0001	-0.0087	0.9930	-0.0120
0.0006	-0.0134	1.0000	0.0018



r/R = 0.707			
x/c	y/c	x/c	y/c
1.0000	-0.0031	0.0049	-0.0098
0.9943	0.0133	0.0148	-0.0191
0.9665	0.0248	0.0267	-0.0266
0.9402	0.0331	0.0500	-0.0356
0.8950	0.0454	0.0532	-0.0363
0.8452	0.0577	0.0935	-0.0433
0.7918	0.0694	0.1168	-0.0453
0.7426	0.0793	0.1351	-0.0464
0.6938	0.0875	0.1867	-0.0476
0.6405	0.0951	0.2434	-0.0477
0.5952	0.1007	0.2895	-0.0473
0.5428	0.1065	0.3426	-0.0460
0.4961	0.1107	0.3927	-0.0451
0.4435	0.1140	0.4462	-0.0432
0.3900	0.1153	0.4872	-0.0422
0.3435	0.1146	0.5401	-0.0404
0.2918	0.1113	0.5944	-0.0384
0.2427	0.1059	0.6456	-0.0360
0.1948	0.0983	0.6892	-0.0338
0.1489	0.0881	0.7342	-0.0312
0.0988	0.0725	0.7857	-0.0281
0.0562	0.0552	0.8363	-0.0247
0.0423	0.0480	0.8865	-0.0217
0.0312	0.0416	0.9161	-0.0196
0.0230	0.0361	0.9477	-0.0169
0.0146	0.0297	0.9745	-0.0137
0.0038	0.0182	0.9823	-0.0145
0.0000	0.0088	1.0000	-0.0031
0.0004	-0.0020		

r/R = 0.756			
x/c	y/c	x/c	y/c
1.0000	-0.0048	0.0119	-0.0111
0.9923	0.0049	0.0169	-0.0145
0.9673	0.0133	0.0307	-0.0214
0.9649	0.0141	0.0412	-0.0251
0.9270	0.0254	0.0712	-0.0312
0.8751	0.0389	0.0936	-0.0337
0.8276	0.0503	0.1179	-0.0352
0.7791	0.0609	0.1392	-0.0361
0.7325	0.0700	0.1859	-0.0370
0.6791	0.0792	0.2256	-0.0374
0.6339	0.0862	0.2838	-0.0377
0.5801	0.0938	0.3352	-0.0375
0.5340	0.0995	0.3853	-0.0373
0.4928	0.1037	0.4375	-0.0365
0.4360	0.1082	0.4851	-0.0361
0.3880	0.1099	0.5327	-0.0352
0.3385	0.1095	0.5773	-0.0345
0.2859	0.1065	0.6283	-0.0331
0.2414	0.1022	0.6822	-0.0317
0.1939	0.0949	0.7283	-0.0302
0.1395	0.0826	0.7807	-0.0285
0.0924	0.0680	0.8238	-0.0267
0.0473	0.0500	0.8796	-0.0245
0.0210	0.0353	0.9048	-0.0233
0.0126	0.0291	0.9350	-0.0218
0.0033	0.0195	0.9680	-0.0196
0.0000	0.0097	0.9835	-0.0176
0.0000	0.0092	0.9923	-0.0164
0.0013	0.0020	1.0000	-0.0048
0.0052	-0.0048		

r/R = 0.805			
x/c	y/c	x/c	y/c
1.0000	0.0010	0.0032	-0.0037
0.9941	0.0102	0.0108	-0.0113
0.9731	0.0192	0.0149	-0.0146
0.9400	0.0292	0.0536	-0.0259
0.8932	0.0416	0.0913	-0.0294
0.8413	0.0539	0.1193	-0.0305
0.8021	0.0622	0.1470	-0.0310
0.7522	0.0717	0.2016	-0.0314
0.6983	0.0808	0.2474	-0.0315
0.6442	0.0889	0.2898	-0.0315
0.5923	0.0958	0.3464	-0.0312
0.5418	0.1014	0.3924	-0.0308
0.4990	0.1050	0.4480	-0.0303
0.4404	0.1078	0.4940	-0.0299
0.4041	0.1081	0.5353	-0.0294
0.3448	0.1063	0.5921	-0.0283
0.2963	0.1029	0.6518	-0.0265
0.2463	0.0978	0.6973	-0.0248
0.1905	0.0891	0.7637	-0.0216
0.1485	0.0796	0.8143	-0.0189
0.0956	0.0639	0.8664	-0.0161
0.0454	0.0438	0.9118	-0.0139
0.0383	0.0402	0.9481	-0.0119
0.0268	0.0337	0.9747	-0.0097
0.0128	0.0242	0.9885	-0.0074
0.0033	0.0147	0.9938	-0.0070
0.0000	0.0066	1.0000	0.0010
0.0001	0.0037		

r/R = 0.856			
x/c	y/c	x/c	y/c
1.0000	-0.0186	0.0000	-0.0109
0.9963	-0.0056	0.0004	-0.0024
0.9762	0.0034	0.0012	-0.0110
0.9588	0.0093	0.0035	-0.0153
0.9140	0.0221	0.0090	-0.0218
0.8724	0.0322	0.0311	-0.0305
0.8129	0.0449	0.0735	-0.0365
0.7647	0.0538	0.1002	-0.0380
0.7105	0.0626	0.1301	-0.0391
0.6684	0.0686	0.1664	-0.0399
0.6121	0.0757	0.2209	-0.0410
0.5664	0.0805	0.2728	-0.0419
0.4971	0.0851	0.3380	-0.0425
0.4417	0.0867	0.3914	-0.0429
0.3966	0.0868	0.4411	-0.0432
0.3522	0.0859	0.5009	-0.0436
0.2879	0.0828	0.5587	-0.0435
0.2450	0.0793	0.6177	-0.0425
0.1922	0.0728	0.6604	-0.0413
0.1464	0.0642	0.7173	-0.0391
0.0886	0.0491	0.7859	-0.0357
0.0396	0.0304	0.8325	-0.0327
0.0258	0.0234	0.8738	-0.0302
0.0175	0.0177	0.9241	-0.0278
0.0102	0.0121	0.9644	-0.0257
0.0045	0.0059	0.9870	-0.0226
0.0006	-0.0014	1.0000	-0.0186

r/R = 0.906			
x/c	y/c	x/c	y/c
1.0000	-0.0118	0.0000	-0.0042
0.9921	0.0045	0.0065	-0.0148
0.9788	0.0112	0.0100	-0.0181
0.9521	0.0205	0.0350	-0.0262
0.9078	0.0321	0.0812	-0.0313
0.8527	0.0441	0.1118	-0.0326
0.7998	0.0531	0.1571	-0.0338
0.7437	0.0610	0.1867	-0.0345
0.6985	0.0666	0.2621	-0.0366
0.6406	0.0732	0.3051	-0.0375
0.5824	0.0784	0.3498	-0.0382
0.5303	0.0809	0.4141	-0.0391
0.4579	0.0815	0.4516	-0.0393
0.3985	0.0806	0.5116	-0.0395
0.3410	0.0789	0.5663	-0.0392
0.2955	0.0771	0.6089	-0.0386
0.2448	0.0745	0.6628	-0.0375
0.1928	0.0703	0.6942	-0.0367
0.1321	0.0621	0.7681	-0.0343
0.0900	0.0532	0.8137	-0.0323
0.0569	0.0426	0.8593	-0.0300
0.0413	0.0358	0.9191	-0.0278
0.0273	0.0283	0.9435	-0.0275
0.0185	0.0226	0.9668	-0.0266
0.0064	0.0121	0.9806	-0.0249
0.0005	0.0012	0.9901	-0.0246
0.0001	-0.0033	1.0000	-0.0118

r/R = 0.959			
x/c	y/c	x/c	y/c
1.0000	-0.0081	0.0000	-0.0040
0.9940	0.0092	0.0037	-0.0087
0.9576	0.0247	0.0101	-0.0133
0.9167	0.0356	0.0351	-0.0195
0.8684	0.0452	0.0820	-0.0243
0.8258	0.0517	0.1111	-0.0261
0.7692	0.0587	0.1508	-0.0283
0.7094	0.0654	0.2061	-0.0302
0.6452	0.0715	0.2693	-0.0319
0.5937	0.0747	0.3452	-0.0333
0.5116	0.0767	0.4025	-0.0339
0.4363	0.0765	0.4523	-0.0342
0.3727	0.0751	0.5096	-0.0341
0.3077	0.0722	0.5737	-0.0335
0.2468	0.0683	0.6211	-0.0329
0.1901	0.0628	0.6791	-0.0318
0.1441	0.0570	0.7291	-0.0307
0.0940	0.0484	0.8097	-0.0277
0.0495	0.0363	0.8677	-0.0257
0.0373	0.0313	0.9107	-0.0246
0.0223	0.0238	0.9518	-0.0234
0.0076	0.0131	0.9646	-0.0218
0.0018	0.0049	0.9868	-0.0181
0.0001	-0.0031	1.0000	-0.0081

## Appendix B

### Pressure Blade Airfoil Coordinates

#### Nomenclature

COLL	collective angle at $0.75R$ , $\theta_c$ , deg
$C_{pl}$	lower surface pressure coefficient, $C_p$
$C_{pu}$	upper surface pressure coefficient, $C_p$
$CQ/S$	rotor torque coefficient over solidity, $C_Q/\sigma$
$CT/S$	rotor thrust coefficient over solidity, $C_T/\sigma$
DENSITY	air density, $\rho$ , slugs/ft <sup>3</sup>
PRESS	ambient pressure, $P_\infty$ , lb/in. <sup>2</sup>
RPM	rotor rotation speed, rev/min
$r/R$	nondimensional rotor radius
TEMP	ambient air temperature, °F
THRUST	rotor thrust, lb
TORQUE	rotor torque, ft-lb
$x/c$	nondimensional chord location

COLL = 0  
 TORQUE = 0.66  
 PRESS = 14.756

RPM = 400  
 CT/S = 0.1416  
 TEMP = 62.22

THRUST = 3.52  
 CQ/S = 0.0133  
 DENSITY = 0.002363

### Cpu

$r/R$ $x/c$	0.125	0.20	0.30
0.06	-0.6495	-0.4812	-0.8003
0.15	-2.2595	-1.4992	-1.2395
0.25	-3.3915	-1.6965	-1.3446
0.35	-3.2764	-1.5414	-1.3007
0.45	-2.4963	-1.2758	-1.0996
0.55	-1.4253	-1.0221	-0.8919
0.65	-1.0724	-0.5996	-0.7429
0.75	-1.1674	-0.4076	-0.3740
0.85	-0.9441	-0.2423	-0.1507
0.95	-0.8444	-0.072	0.0499

### Cpl

$r/R$ $x/c$	0.125	0.20	0.30
0.10	-0.9516	-0.3282	-0.3908
0.15	-1.1217	-0.5131	-0.6071
0.30	-1.3703	-0.5791	-0.4864
0.40	****	****	-0.5495
0.50	-1.1121	-0.4109	-0.2511
0.70	-0.5612	-0.1271	-0.1344
0.80	-0.8565	-0.1066	-0.1147
0.90	-0.5703	0.0566	0.0522

COLL = 0  
 TORQUE = 0.99  
 PRESS = 14.756

RPM = 600  
 CT/S = 0.0946  
 TEMP = 62.17

THRUST = 5.30  
 CQ/S = 0.0088  
 DENSITY = 0.002363

Cpu

$r/R$ $x/c$	0.125	0.20	0.30
0.06	-0.6525	-0.4183	-0.7847
0.15	-2.4165	-1.4551	-1.1718
0.25	-3.2502	-1.6970	-1.3725
0.35	-3.1646	-1.5874	-1.2724
0.45	-2.5000	-1.3651	-1.0687
0.55	-1.3517	-1.0091	-0.8866
0.65	-1.1562	-0.5581	-0.6353
0.75	-1.1326	-0.4156	-0.2951
0.85	-1.1520	-0.2679	-0.1650
0.95	-0.8893	-0.0218	0.0504

Cpl

$r/R$ $x/c$	0.125	0.20	0.30
0.10	-1.0609	-0.4225	-0.4234
0.15	-1.1143	-0.5435	-0.6467
0.30	-1.3636	-0.6274	-0.5110
0.40	****	****	-0.4972
0.50	-1.0774	-0.4644	-0.2581
0.70	-0.7343	-0.1277	-0.1313
0.80	-0.9086	-0.0998	-0.0525
0.90	-0.6726	0.0505	0.0432

COLL = 0  
TORQUE = 1.28  
PRESS = 14.756

RPM = 800  
CT/S = 0.0546  
TEMP = 62.39

THRUST = 5.43  
CQ/S = 0.0064  
DENSITY = 0.002363

### Cpu

r/R \ x/c	0.125	0.20	0.30	0.40
0.06	-0.7720	-0.5964	-0.8753	-0.6802
0.15	-2.3731	-1.7157	-1.2331	-0.9496
0.25	-3.1938	-1.9471	-1.4282	-1.1096
0.35	-2.9967	-1.6974	-1.3043	-1.0180
0.45	-2.0054	-1.4100	-1.0640	-0.8754
0.55	-1.2619	-0.9386	-0.8448	-0.7476
0.65	-1.0351	-0.4435	-0.5782	-0.5264
0.75	-1.0308	-0.2868	-0.2819	-0.2671
0.85	-1.1887	-0.2004	-0.1330	-0.1964
0.95	-0.7900	0.0314	0.0566	0.0897

r/R \ x/c	0.50	0.60	0.70	0.75
0.06	-0.3011	-0.2360	-0.0931	0.1099
0.15	-0.7567	-0.6031	-0.4296	-0.3179
0.25	-0.8180	-0.6934	-0.5363	-0.4782
0.35	-0.8098	-0.7116	-0.5812	-0.5502
0.45	-0.6792	-0.6448	-0.5356	-0.5333
0.55	-0.5966	-0.5694	-0.4767	-0.4564
0.65	-0.5090	-0.4930	-0.4055	-0.3886
0.75	-0.3442	-0.3904	-0.3495	-0.3429
0.85	-0.1954	-0.2392	-0.2952	-0.2868
0.95	0.0442	0.0257	-0.0414	-0.0624

### Cpl

r/R \ x/c	0.125	0.20	0.30	0.40
0.10	-0.5781	-0.2719	-0.3591	-0.5079
0.15	-0.9102	-0.4040	-0.5875	-0.5824
0.30	-1.0610	-0.5226	-0.4706	-0.3812
0.40	****	****	-0.4530	-0.3359
0.50	-0.9337	-0.3831	-0.2308	-0.2152
0.70	-0.5929	-0.0861	-0.1208	-0.0497
0.80	-0.7991	-0.0471	-0.0404	-0.0219
0.90	-0.5395	0.0788	0.0467	0.0568

r/R \ x/c	0.50	0.60	0.70	0.75
0.10	-0.4229	-0.6287	-0.5955	-0.5784
0.15	-0.4487	-0.5065	-0.4893	-0.4769
0.30	-0.3821	-0.2911	-0.2169	-0.1641
0.40	-0.3122	-0.2204	-0.1515	-0.1214
0.50	-0.1768	-0.1195	-0.1006	-0.0826
0.70	-0.0177	-0.0444	-0.0402	-0.0285
0.80	0.0020	-0.0240	-0.0045	0.0024
0.90	0.0576	0.0395	0.0458	0.0381

COLL = 0  
TORQUE = 2.13  
PRESS = 14.756

RPM = 1200  
CT/S = 0.0386  
TEMP = 62.32

THRUST = 8.65  
CQ/S = 0.0048  
DENSITY = 0.002363

### Cpu

r/R \ x/c	0.125	0.20	0.30	0.40
0.06	-0.8260	-0.5342	-0.9775	-0.7171
0.15	-2.5671	-1.5419	-1.3223	-0.9772
0.25	-3.3517	-1.8076	-1.5673	-1.1862
0.35	-3.2113	-1.5977	-1.4177	-1.0423
0.45	-1.9574	-1.3085	-1.1615	-0.8900
0.55	-1.2908	-0.7899	-0.9120	-0.7360
0.65	-1.0438	-0.4346	-0.5198	-0.4769
0.75	-1.0629	-0.3078	-0.2911	-0.2680
0.85	-1.0112	-0.1843	-0.1005	-0.1751
0.95	-0.7602	0.0194	0.1083	0.1238

r/R \ x/c	0.50	0.60	0.70	0.75
0.06	-0.2894	-0.2138	-0.0863	0.1254
0.15	-0.7454	-0.5748	-0.4441	-0.2904
0.25	-0.8104	-0.6516	-0.5387	-0.4843
0.35	-0.8157	-0.7063	-0.5912	-0.5583
0.45	-0.6538	-0.6433	-0.5448	-0.5309
0.55	-0.5715	-0.5279	-0.4724	-0.4307
0.65	-0.4389	-0.4253	-0.3828	-0.3310
0.75	-0.3201	-0.3441	-0.3239	-0.2884
0.85	-0.1982	-0.2127	-0.2596	-0.2399
0.95	0.0521	0.0541	-0.0339	-0.0409

### Cpl

r/R \ x/c	0.125	0.20	0.30	0.40
0.10	-0.4891	-0.2619	-0.3673	-0.4975
0.15	-0.6560	-0.3927	-0.6255	-0.5816
0.30	-0.9164	-0.5003	-0.4999	-0.3935
0.40	****	****	-0.4254	-0.3322
0.50	-0.8973	-0.3724	-0.2506	-0.2156
0.70	-0.5944	-0.0550	-0.0744	-0.0514
0.80	-0.7519	-0.0244	-0.0170	-0.0180
0.90	-0.5796	0.0750	0.0546	0.0489

r/R \ x/c	0.50	0.60	0.70	0.75
0.10	-0.4185	-0.6381	-0.5916	-0.6209
0.15	-0.4521	-0.5152	-0.4900	-0.4982
0.30	-0.3867	-0.2959	-0.1885	-0.1669
0.40	-0.3074	-0.2074	-0.1493	-0.1229
0.50	-0.1878	-0.0902	-0.1002	-0.0772
0.70	-0.0197	-0.0507	-0.0396	-0.0292
0.80	0.0017	-0.0297	-0.0019	0.0071
0.90	0.0518	0.0284	0.0506	0.0363



COLL = 0  
TORQUE = 3.83  
PRESS = 14.756

RPM = 1800  
CT/S = 0.0318  
TEMP = 62.28

THRUST = 16.04  
CQ/S = 0.0038  
DENSITY = 0.002363

Cpu

r/R x/c	0.125	0.20	0.30	0.40
0.06	-0.8540	-0.5554	-0.9261	-0.6983
0.15	-2.5262	-1.5363	-1.2485	-0.9589
0.25	-3.2047	-1.8248	-1.4810	-1.1087
0.35	-3.0929	-1.5824	-1.3474	-1.0342
0.45	-1.8019	-1.2963	-1.0978	-0.8084
0.55	-1.2430	-0.7333	-0.7829	-0.6513
0.65	-0.9972	-0.4156	-0.5018	-0.4460
0.75	-1.0554	-0.2949	-0.2612	-0.2301
0.85	-1.0302	-0.1454	-0.0891	-0.1078
0.95	-0.8710	0.0462	0.0923	0.1479

r/R x/c	0.50	0.60	0.70	0.75
0.06	-0.3220	-0.2019	-0.0756	0.1275
0.15	-0.7761	-0.5611	-0.4541	-0.2438
0.25	-0.8235	-0.6386	-0.5282	-0.6131
0.35	-0.7658	-0.6924	-0.5800	-0.5605
0.45	-0.6005	-0.5519	-0.5295	-0.5009
0.55	-0.5779	-0.4960	-0.4556	-0.4073
0.65	-0.4195	-0.4174	-0.3641	-0.3049
0.75	-0.2955	-0.3257	-0.3021	-0.2700
0.85	-0.1763	-0.1859	-0.2455	-0.2195
0.95	0.0829	0.0864	-0.0093	-0.0201

Cpl

r/R x/c	0.125	0.20	0.30	0.40
0.10	-0.4385	-0.2237	-0.3715	-0.5067
0.15	-0.6915	-0.3653	-0.6190	-0.5895
0.30	-0.8957	-0.4760	-0.4943	-0.3960
0.40	****	****	-0.3925	-0.3237
0.50	-0.8316	-0.3435	-0.2425	-0.2097
0.70	-0.5454	-0.0173	-0.0628	-0.0587
0.80	-0.6771	-0.0083	-0.0160	-0.0245
0.90	-0.4855	0.0768	0.0477	0.0340

r/R x/c	0.50	0.60	0.70	0.75
0.10	-0.3937	-0.6479	-0.5863	-0.6140
0.15	-0.4346	-0.5193	-0.4942	-0.4713
0.30	-0.3712	-0.2839	-0.1703	-0.1488
0.40	-0.2481	-0.1602	-0.1421	-0.1084
0.50	-0.1480	-0.0816	-0.0902	-0.0570
0.70	-0.0171	-0.0493	-0.0289	-0.0161
0.80	0.0100	-0.0277	0.0118	0.0269
0.90	0.0560	0.0251	0.0649	0.0507

COLL = 0  
TORQUE = 6.37  
PRESS = 14.756

RPM = 2400  
CT/S = 0.0298  
TEMP = 62.29

THRUST = 26.71  
CQ/S = 0.0036  
DENSITY = 0.002363

### Cpu

r/R x/c	0.125	0.20	0.30	0.40
0.06	-0.8150	-0.5811	-0.9619	-0.6676
0.15	-2.4203	-1.5727	-1.3004	-0.9207
0.25	-3.0602	-1.8617	-1.3894	-1.0567
0.35	-2.9125	-1.6030	-1.3420	-0.9995
0.45	-1.7911	-1.1668	-1.0889	-0.7499
0.55	-1.1950	-0.7365	-0.7680	-0.6134
0.65	-0.9702	-0.4195	-0.4778	-0.4170
0.75	-1.0843	-0.2822	-0.2239	-0.2143
0.85	-1.0435	-0.1208	-0.0571	-0.0953
0.95	-0.7827	0.0713	0.0974	0.1519

r/R x/c	0.50	0.60	0.70	0.75
0.06	-0.2966	-0.1850	-0.0565	0.1272
0.15	-0.7303	-0.5411	-0.4331	-0.2231
0.25	-0.7981	-0.6139	-0.5004	-0.5598
0.35	-0.7359	-0.6559	-0.5586	-0.5258
0.45	-0.5757	-0.5238	-0.5051	-0.4669
0.55	-0.5526	-0.4681	-0.4268	-0.3672
0.65	-0.3986	-0.3824	-0.3370	-0.2740
0.75	-0.2739	-0.2810	-0.2744	-0.2307
0.85	-0.1526	-0.1236	-0.2170	-0.1797
0.95	0.1083	0.0989	0.0200	0.0142

### Cpl

r/R x/c	0.125	0.20	0.30	0.40
0.10	-0.3345	-0.1860	-0.3499	-0.4837
0.15	-0.6098	-0.3371	-0.6197	-0.5666
0.30	-0.8031	-0.4448	-0.5001	-0.3799
0.40	****	****	-0.3791	-0.3097
0.50	-0.7898	-0.3293	-0.2385	-0.1712
0.70	-0.5206	-0.0011	-0.0654	-0.0544
0.80	-0.6717	0.0159	-0.0107	-0.0199
0.90	-0.5375	0.0884	0.0501	0.0353

r/R x/c	0.50	0.60	0.70	0.75
0.10	-0.3782	-0.6226	-0.5610	-0.5928
0.15	-0.4235	-0.5005	-0.4918	-0.3878
0.30	-0.3518	-0.2238	-0.1529	-0.1206
0.40	-0.2314	-0.1505	-0.1275	-0.0919
0.50	-0.1329	-0.0735	-0.0714	-0.0353
0.70	-0.0112	-0.0405	-0.0114	0.0053
0.80	0.0183	-0.0224	0.0302	0.0489
0.90	0.0612	0.0209	0.0793	0.0685

COLL = 4  
 TORQUE = 0.77  
 PRESS = 14.756

RPM = 400  
 CT/S = 0.1416  
 TEMP = 59.19

THRUST = 3.54  
 CQ/S = 0.0154  
 DENSITY = 0.002376

### Cpu

$r/R$ $x/c$	0.125	0.20	0.30
0.06	-0.9120	-0.6163	-1.0859
0.15	-3.0905	-1.7879	-1.4252
0.25	-3.7900	-2.1028	-1.4447
0.35	-3.4111	-1.6706	-1.3977
0.45	-2.9788	-1.5432	-1.2321
0.55	-1.5084	-1.0331	-0.9829
0.65	-1.1233	-0.5971	-0.6880
0.75	-1.0075	-0.3345	-0.2986
0.85	-1.1877	-0.2708	-0.1836
0.95	-0.8165	-0.0116	0.0542

### Cpl

$r/R$ $x/c$	0.125	0.20	0.30
0.10	-0.7033	-0.2453	-0.2318
0.15	-0.7604	-0.3805	-0.4262
0.30	-0.9581	-0.4697	-0.3988
0.40	****	****	-0.3731
0.50	-0.9762	-0.3290	-0.2023
0.70	-0.6370	-0.0995	-0.1031
0.80	-0.6366	-0.0070	-0.0873
0.90	-0.6205	0.0378	0.0591

COLL = 4  
 TORQUE = 1.22  
 PRESS = 14.756

RPM = 600  
 CT/S = 0.0959  
 TEMP = 59.41

THRUST = 5.40  
 CQ/S = 0.0108  
 DENSITY = 0.002375

Cpu

$r/R$ $x/c$	0.125	0.20	0.30
0.06	-1.0904	-0.8227	-1.2638
0.15	-2.7822	-1.9161	-1.5757
0.25	-3.5868	-2.1454	-1.6526
0.35	-3.4449	-1.8595	-1.5429
0.45	-2.6677	-1.5589	-1.2864
0.55	-1.4796	-0.9884	-1.0608
0.65	-1.2449	-0.5068	-0.6793
0.75	-1.2443	-0.2908	-0.3215
0.85	-1.1045	-0.2015	-0.1928
0.95	-0.9687	0.0544	0.0543

Cpl

$r/R$ $x/c$	0.125	0.20	0.30
0.10	-0.4888	-0.0240	-0.1931
0.15	-0.7615	-0.1267	-0.4104
0.30	-0.9369	-0.3024	-0.3960
0.40	****	-0.2854	-0.4123
0.50	-0.8568	-0.2210	-0.1868
0.70	-0.6127	-0.0183	-0.1145
0.80	-0.6812	0.0285	-0.0916
0.90	-0.5364	0.1240	0.0537

COLL = 4  
TORQUE = 1.50  
PRESS = 14.756

RPM = 800  
CT/S = 0.0815  
TEMP = 59.83

THRUST = 8.15  
CQ/S = 0.0075  
DENSITY = 0.002373

Cpu

r/R \ x/c	0.125	0.20	0.30	0.40
0.06	-1.1377	-0.7225	-1.1623	-0.9496
0.15	-2.8314	-1.7448	-1.4101	-1.1165
0.25	-3.5660	-1.9944	-1.5250	-1.2595
0.35	-3.4967	-1.7395	-1.4381	-1.0905
0.45	-2.1849	-1.3951	-1.1832	-0.9145
0.55	-1.4239	-0.9279	-0.9607	-0.7681
0.65	-1.2160	-0.4928	-0.5688	-0.5192
0.75	-1.0616	-0.3464	-0.2978	-0.2668
0.85	-1.1578	-0.2190	-0.1730	-0.1640
0.95	-0.7279	0.0015	0.0767	0.0921

r/R \ x/c	0.50	0.60	0.70	0.75
0.06	-0.6040	-0.4609	-0.3056	-0.0982
0.15	-0.9700	-0.7592	-0.5999	-0.3653
0.25	-0.9908	-0.8112	-0.6630	-0.6987
0.35	-0.9503	-0.7965	-0.6873	-0.6426
0.45	-0.7905	-0.6891	-0.6127	-0.5915
0.55	-0.6752	-0.6018	-0.5183	-0.4769
0.65	-0.5262	-0.5345	-0.4441	-0.3777
0.75	-0.3284	-0.4592	-0.3819	-0.3113
0.85	-0.2018	-0.2359	-0.2713	-0.2483
0.95	0.0615	0.0280	-0.0249	-0.0405

Cpl

r/R \ x/c	0.125	0.20	0.30	0.40
0.10	-0.3007	-0.1171	-0.1773	-0.2570
0.15	-0.2535	-0.2561	-0.3715	-0.3701
0.30	-0.6325	-0.4030	-0.3607	-0.2506
0.40	****	-0.4438	-0.3898	-0.2090
0.50	-0.6712	-0.3221	-0.1704	-0.1298
0.70	-0.5206	-0.0720	-0.0963	-0.0459
0.80	-0.5582	-0.0102	-0.0603	-0.0079
0.90	-0.4200	0.0865	0.0763	0.0569

r/R \ x/c	0.50	0.60	0.70	0.75
0.10	-0.2000	-0.4055	-0.4090	-0.4329
0.15	-0.2721	-0.3366	-0.3430	-0.3216
0.30	-0.2767	-0.1798	-0.1544	-0.1471
0.40	-0.2125	-0.1455	-0.1215	-0.1197
0.50	-0.1094	-0.0810	-0.0728	-0.0647
0.70	-0.0139	-0.0169	-0.0209	-0.0084
0.80	0.0106	-0.0009	0.0149	0.0179
0.90	0.0703	0.0554	0.0606	0.0382

COLL = 4  
TORQUE = 2.82  
PRESS = 14.756

RPM = 1200  
CT/S = 0.0677  
TEMP = 60.19

THRUST = 15.21  
CQ/S = 0.0063  
DENSITY = 0.002371

### Cpu

r/R x/c	0.125	0.20	0.30	0.40
0.06	-1.0174	-0.6947	-1.1631	-0.9461
0.15	-2.7220	-1.6609	-1.4241	-1.1113
0.25	-3.4009	-1.9000	-1.5974	-1.2691
0.35	-3.2554	-1.6428	-1.4449	-1.0877
0.45	-1.9812	-1.3909	-1.1740	-0.9187
0.55	-1.3700	-0.8206	-0.8622	-0.7078
0.65	-1.1237	-0.4714	-0.5234	-0.4734
0.75	-1.0764	-0.3484	-0.2876	-0.2517
0.85	-1.0968	-0.1775	-0.1273	-0.1285
0.95	-0.8744	0.0321	0.0793	0.1177

r/R x/c	0.50	0.60	0.70	0.75
0.06	-0.5765	-0.4430	-0.2998	-0.0922
0.15	-0.9400	-0.7329	-0.6043	-0.3648
0.25	-0.9554	-0.7967	-0.6618	-0.7165
0.35	-0.9113	-0.7844	-0.6841	-0.6622
0.45	-0.7378	-0.6762	-0.6051	-0.5833
0.55	-0.6105	-0.5861	-0.5157	-0.4629
0.65	-0.4542	-0.5104	-0.4074	-0.3429
0.75	-0.3104	-0.3636	-0.3286	-0.2892
0.85	-0.1750	-0.2239	-0.2560	-0.2300
0.95	0.0852	0.0476	-0.0181	-0.0226

### Cpl

r/R x/c	0.125	0.20	0.30	0.40
0.10	-0.3184	-0.1195	-0.1719	-0.2640
0.15	-0.4876	-0.2534	-0.3935	-0.3757
0.30	-0.7216	-0.3867	-0.3627	-0.2700
0.40	****	-0.4092	-0.3381	-0.2198
0.50	-0.6757	-0.2903	-0.1782	-0.1387
0.70	-0.4775	-0.0410	-0.0929	-0.0533
0.80	-0.6166	0.0138	-0.0218	-0.0081
0.90	-0.5485	0.0961	0.0641	0.0538

r/R x/c	0.50	0.60	0.70	0.75
0.10	-0.1918	-0.4057	-0.4163	-0.4339
0.15	-0.2664	-0.3339	-0.3523	-0.3203
0.30	-0.2706	-0.1832	-0.1564	-0.1473
0.40	-0.2108	-0.1420	-0.1207	-0.0781
0.50	-0.1133	-0.0841	-0.0617	-0.0344
0.70	-0.0045	-0.0230	-0.0128	-0.0065
0.80	0.0200	0.0036	0.0214	0.0283
0.90	0.0638	0.0555	0.0641	0.0433

COLL = 4  
TORQUE = 5.66  
PRESS = 14.756

RPM = 1800  
CT/S = 0.0598  
TEMP = 59.71

THRUST = 30.27  
CQ/S = 0.0056  
DENSITY = 0.002372

### Cpu

r/R \ x/c	0.125	0.20	0.30	0.40
0.06	-0.9713	-0.6955	-1.1462	-0.9197
0.15	-2.6746	-1.6997	-1.3764	-1.0875
0.25	-3.4166	-1.9419	-1.4730	-1.1973
0.35	-3.1625	-1.7024	-1.3931	-1.0791
0.45	-1.9424	-1.3493	-1.1173	-0.8390
0.55	-1.2198	-0.8027	-0.7895	-0.6523
0.65	-1.0897	-0.4522	-0.5016	-0.4367
0.75	-1.0529	-0.3215	-0.2602	-0.2078
0.85	-1.0458	-0.1581	-0.1186	-0.0674
0.95	-0.877	0.0396	0.0759	0.1393

r/R \ x/c	0.50	0.60	0.70	0.75
0.06	-0.5599	-0.4263	-0.2772	-0.0726
0.15	-0.9257	-0.7136	-0.5981	-0.3605
0.25	-0.9227	-0.7628	-0.6376	-0.7028
0.35	-0.8321	-0.7596	-0.6583	-0.6883
0.45	-0.6352	-0.5894	-0.5799	-0.5568
0.55	-0.5873	-0.5251	-0.4891	-0.4412
0.65	-0.4191	-0.4268	-0.3782	-0.3310
0.75	-0.2801	-0.3407	-0.3029	-0.2632
0.85	-0.1453	-0.1992	-0.2404	-0.2017
0.95	0.1109	0.0894	0.0054	0.0055

### Cpl

r/R \ x/c	0.125	0.20	0.30	0.40
0.10	-0.3756	-0.1055	-0.1775	-0.2792
0.15	-0.5812	-0.2305	-0.4236	-0.3901
0.30	-0.7821	-0.3781	-0.3800	-0.2797
0.40	****	-0.3987	-0.3065	-0.2227
0.50	-0.7619	-0.2856	-0.1787	-0.1481
0.70	-0.5237	-0.0092	-0.0616	-0.0447
0.80	-0.6587	0.0165	-0.0063	-0.0016
0.90	-0.5112	0.0808	0.0507	0.0386

r/R \ x/c	0.50	0.60	0.70	0.75
0.10	-0.1860	-0.4119	-0.3987	-0.4230
0.15	-0.2599	-0.3410	-0.3452	-0.3125
0.30	-0.2685	-0.1809	-0.1081	-0.0806
0.40	-0.2058	-0.1369	-0.0904	-0.0559
0.50	-0.0944	-0.0590	-0.0490	-0.0175
0.70	0.0029	-0.0109	-0.0046	0.0045
0.80	0.0249	0.0036	0.0306	0.0456
0.90	0.0572	0.0498	0.0738	0.0538

COLL = 4  
TORQUE = 10.04  
PRESS = 14.756

RPM = 2400  
CT/S = 0.0568  
TEMP = 59.24

THRUST = 51.09  
CQ/S = 0.0056  
DENSITY = 0.002375

### Cpu

r/R x/c	0.125	0.20	0.30	0.40
0.06	-0.9754	-0.6713	-1.0954	-0.8988
0.15	-2.7090	-1.6253	-1.3376	-1.0677
0.25	-3.4447	-1.9307	-1.4064	-1.1653
0.35	-3.1791	-1.6753	-1.3257	-1.0656
0.45	-1.9712	-1.2265	-1.0688	-0.7937
0.55	-1.3218	-0.7929	-0.7548	-0.6241
0.65	-1.0525	-0.4590	-0.4820	-0.4161
0.75	-1.0920	-0.3097	-0.2423	-0.1996
0.85	-1.0582	-0.1551	-0.1060	-0.0567
0.95	-0.8749	0.0471	0.0598	0.1446

r/R x/c	0.50	0.60	0.70	0.75
0.06	-0.5362	-0.4036	-0.2480	-0.0466
0.15	-0.8740	-0.7000	-0.5720	-0.3580
0.25	-0.8995	-0.7374	-0.6056	-0.6827
0.35	-0.8049	-0.7383	-0.6358	-0.6415
0.45	-0.6132	-0.5701	-0.5544	-0.5296
0.55	-0.5614	-0.5030	-0.4573	-0.4077
0.65	-0.3957	-0.4050	-0.3520	-0.3059
0.75	-0.2600	-0.3078	-0.2779	-0.2361
0.85	-0.1225	-0.1569	-0.2112	-0.1715
0.95	0.1323	0.1212	0.0341	0.0333

### Cpl

r/R x/c	0.125	0.20	0.30	0.40
0.10	-0.2645	-0.0921	-0.1859	-0.2711
0.15	-0.5892	-0.2505	-0.4310	-0.3842
0.30	-0.7229	-0.3778	-0.3820	-0.2713
0.40	****	-0.3865	-0.2975	-0.2090
0.50	-0.7062	-0.2873	-0.1825	-0.1430
0.70	-0.5176	0.0023	-0.0487	-0.0237
0.80	-0.6194	0.0143	-0.0072	0.0045
0.90	-0.5342	0.0800	0.0454	0.0370

r/R x/c	0.50	0.60	0.70	0.75
0.10	-0.1807	-0.4090	-0.3820	-0.4043
0.15	-0.2572	-0.3363	-0.3492	-0.2996
0.30	-0.2470	-0.1748	-0.0871	-0.0554
0.40	-0.1525	-0.0993	-0.0739	-0.0444
0.50	-0.0883	-0.0215	-0.0327	-0.0022
0.70	0.0131	-0.0074	0.0108	0.0236
0.80	0.0380	0.0049	0.0471	0.0647
0.90	0.0628	0.0455	0.0859	0.0714



COLL = 8  
 TORQUE = 1.12  
 PRESS = 14.718

RPM = 400  
 CT/S = 0.1925  
 TEMP = 64.75

THRUST = 4.75  
 CQ/S = 0.0227  
 DENSITY = 0.002343

### Cpu

$r/R$ $x/c$	0.125	0.20	0.30
0.06	-1.4032	-0.9129	-1.5430
0.15	-3.4942	-1.9267	-1.6584
0.25	-4.7281	-2.2552	-1.6298
0.35	-3.9359	-1.7702	-1.4408
0.45	-3.0945	-1.5061	-1.2632
0.55	-1.7761	-1.1667	-1.0086
0.65	-1.6629	-0.5545	-0.7441
0.75	-1.1935	-0.2898	-0.3697
0.85	****	-0.1898	-0.2224
0.95	-0.7374	-0.0552	-0.0285

### Cpl

$r/R$ $x/c$	0.125	0.20	0.30
0.10	-0.3930	0.1145	0.0915
0.15	-0.5053	-0.0170	-0.1715
0.30	-0.7126	-0.1929	-0.1953
0.40	****	****	-0.1408
0.50	-0.6396	-0.1823	-0.0927
0.70	-0.5094	-0.0144	-0.0116
0.80	-0.6403	0.0710	-0.0023
0.90	-0.5979	0.0516	0.0398

COLL = 8  
 TORQUE = 1.93  
 PRESS = 14.718

RPM = 600  
 CT/S = 0.1409  
 TEMP = 64.66

THRUST = 7.82  
 CQ/S = 0.0174  
 DENSITY = 0.002343

### Cpu

r/R \ x/c	0.125	0.20	0.30
0.06	-1.4635	-1.1502	-1.4548
0.15	-3.4158	-2.1598	-1.7333
0.25	-4.1058	-2.3471	-1.6791
0.35	-4.0444	-1.8291	-1.4956
0.45	-3.0682	-1.5903	-1.2527
0.55	-1.8300	-0.9438	-1.0370
0.65	-1.5501	-0.5485	-0.5962
0.75	-1.4814	-0.3527	-0.3300
0.85	****	-0.2034	-0.1652
0.95	-0.8367	0.0085	-0.0002

### Cpl

r/R \ x/c	0.125	0.20	0.30
0.10	-0.2988	0.2600	0.0942
0.15	-0.3206	0.0309	-0.1623
0.30	-0.5923	-0.1339	-0.1980
0.40	****	****	-0.1450
0.50	-0.4513	-0.1196	-0.0815
0.70	-0.5653	0.0294	-0.0063
0.80	-0.6633	0.0791	0.0105
0.90	-0.4885	0.1081	0.0483

COLL = 8  
TORQUE = 2.63  
PRESS = 14.718

RPM = 800  
CT/S = 0.1292  
TEMP = 68.66

THRUST = 12.65  
CQ/S = 0.0134  
DENSITY = 0.002324

### Cpu

r/R x/c	0.125	0.20	0.30	0.40
0.06	-1.6303	-1.1863	-1.5897	-1.3187
0.15	-3.4085	-2.1927	-1.7236	-1.3367
0.25	-4.0958	-2.2975	-1.7513	-1.3879
0.35	-4.0132	-1.9788	-1.5482	-1.1673
0.45	-2.7973	-1.7078	-1.3160	-0.9961
0.55	-1.7371	-0.9273	-1.0622	-0.8647
0.65	-1.4780	-0.5257	-0.5557	-0.4865
0.75	-1.3764	-0.3427	-0.3207	-0.2860
0.85	****	-0.1892	-0.1553	-0.1727
0.95	-0.9942	0.0301	0.0326	0.0478

r/R x/c	0.50	0.60	0.70	0.75
0.06	-1.0305	-0.8390	-0.6776	-0.4859
0.15	-1.2554	-1.0207	-0.8585	-0.6375
0.25	-1.1760	-0.9872	-0.8412	-0.8237
0.35	-1.0506	-0.9179	-0.8182	-0.7874
0.45	-0.9223	-0.7958	-0.7203	-0.7003
0.55	-0.7267	-0.7044	-0.6176	-0.5535
0.65	-0.4972	-0.5554	-0.4987	-0.4289
0.75	-0.3587	-0.4004	-0.3425	-0.3318
0.85	-0.2248	-0.2680	-0.2780	-0.2617
0.95	0.0410	0.0067	-0.0342	-0.0428

### Cpl

r/R x/c	0.125	0.20	0.30	0.40
0.10	-0.2479	0.2154	0.1015	0.0269
0.15	-0.3227	0.0640	-0.1601	-0.1169
0.30	-0.5767	-0.1267	-0.2022	-0.1085
0.40	****	-0.0511	-0.1577	-0.1653
0.50	-0.5633	-0.1383	-0.0728	-0.0275
0.70	-0.5809	0.0606	-0.0006	0.0434
0.80	-0.6597	0.0941	0.0138	0.0383
0.90	-0.5353	0.1047	0.0549	0.0802

r/R x/c	0.50	0.60	0.70	0.75
0.10	0.0817	-0.1168	-0.1343	-0.1547
0.15	-0.0326	-0.1096	-0.1258	-0.1064
0.30	-0.1270	-0.0515	-0.0291	-0.0195
0.40	-0.1912	-0.0497	-0.0245	-0.0111
0.50	-0.0073	0.0000	0.0030	0.0056
0.70	0.0616	0.0342	0.0286	0.0282
0.80	0.0527	0.0474	0.0514	0.0408
0.90	0.0992	0.0905	0.0809	0.0662

COLL = 8  
 TORQUE = 5.13  
 PRESS = 14.718

RPM = 1200  
 CT/S = 0.1109  
 TEMP = 69.49

THRUST = 24.39  
 CQ/S = 0.0117  
 DENSITY = 0.002321

### Cpu

r/R \ x/c	0.125	0.20	0.30	0.40
0.06	-1.4903	-1.1026	-1.5227	-1.2953
0.15	-3.2669	-2.1207	-1.6602	-1.3254
0.25	-3.9446	-2.3042	-1.7543	-1.4024
0.35	-3.8785	-1.9281	-1.5066	-1.1677
0.45	-2.3780	-1.5893	-1.2661	-0.9993
0.55	-1.6877	-0.8699	-0.9103	-0.7208
0.65	-1.4419	-0.5007	-0.5269	-0.4762
0.75	-1.4092	-0.3586	-0.2983	-0.2715
0.85	****	-0.1694	-0.1365	-0.1391
0.95	-1.1435	0.0302	0.05	0.0664

r/R \ x/c	0.50	0.60	0.70	0.75
0.06	-0.9935	-0.8272	-0.6566	-0.4777
0.15	-1.2161	-1.0117	-0.8564	-0.6379
0.25	-1.1521	-0.9882	-0.8365	-0.8211
0.35	-1.0467	-0.9202	-0.8093	-0.7747
0.45	-0.8695	-0.7906	-0.6965	-0.6858
0.55	-0.6634	-0.6620	-0.5773	-0.5358
0.65	-0.4811	-0.4886	-0.4373	-0.3989
0.75	-0.3386	-0.3923	-0.3441	-0.3180
0.85	-0.2032	-0.2458	-0.2722	-0.2466
0.95	0.0555	0.0364	-0.0272	-0.0349

### Cpl

r/R \ x/c	0.125	0.20	0.30	0.40
0.10	-0.3353	0.2024	0.0840	0.0134
0.15	-0.5408	0.0119	-0.1693	-0.1340
0.30	-0.7495	-0.1728	-0.1992	-0.1288
0.40	****	-0.1282	-0.1462	-0.1279
0.50	-0.7595	-0.1709	-0.0807	-0.0406
0.70	-0.5982	0.0537	-0.0105	0.0198
0.80	-0.7493	0.0947	-0.0002	0.0259
0.90	-0.6556	0.1134	0.0653	0.0625

r/R \ x/c	0.50	0.60	0.70	0.75
0.10	0.0817	-0.1176	-0.1293	-0.1530
0.15	-0.0355	-0.1121	-0.1232	-0.1053
0.30	-0.1250	-0.0518	-0.0248	-0.0168
0.40	-0.1353	-0.0416	-0.0176	-0.0042
0.50	-0.0123	0.0009	0.0067	0.0078
0.70	0.0455	0.0309	0.0322	0.0275
0.80	0.0477	0.0414	0.0542	0.0397
0.90	0.0884	0.0775	0.0849	0.0639

COLL = 8  
TORQUE = 10.30  
PRESS = 14.718

RPM = 1800  
CT/S = 0.1014  
TEMP = 70.221

THRUST = 50.10  
CQ/S = 0.0104  
DENSITY = 0.002317

### Cpu

r/R \ x/c	0.125	0.20	0.30	0.40
0.06	-1.3527	-0.9199	-1.4796	-1.2605
0.15	-3.2964	-1.8883	-1.6156	-1.2914
0.25	-3.8506	-2.1263	-1.7700	-1.3340
0.35	-3.5295	-1.7517	-1.4969	-1.1459
0.45	-2.1616	-1.4309	-1.2020	-0.8892
0.55	-1.5420	-0.8057	-0.8036	-0.6688
0.65	-1.2693	-0.4879	-0.5028	-0.4408
0.75	-1.3715	-0.3498	-0.2680	-0.2181
0.85	****	-0.1876	-0.1231	-0.0719
0.95	-1.0412	0.0065	0.0492	0.081

r/R \ x/c	0.50	0.60	0.70	0.75
0.06	-0.9527	-0.7788	-0.6303	-0.4311
0.15	-1.1605	-0.9531	-0.8539	-0.5683
0.25	-1.0903	-0.9076	-0.8132	-0.8757
0.35	-0.9485	-0.8540	-0.7899	-0.7877
0.45	-0.7170	-0.6747	-0.6755	-0.6353
0.55	-0.6279	-0.5792	-0.5452	-0.4926
0.65	-0.4407	-0.4435	-0.4118	-0.3587
0.75	-0.2923	-0.2846	-0.3245	-0.2787
0.85	-0.1443	-0.1556	-0.2444	-0.2059
0.95	0.0935	0.0270	0.0078	0.0038

### Cpl

r/R \ x/c	0.125	0.20	0.30	0.40
0.10	-0.3652	0.0687	0.0603	-0.0018
0.15	-0.6092	-0.1052	-0.1936	-0.1504
0.30	-0.7219	-0.2491	-0.2208	-0.1389
0.40	****	-0.2271	-0.1415	-0.1111
0.50	-0.7150	-0.1994	-0.0921	-0.0510
0.70	-0.4912	0.0180	-0.0227	0.0063
0.80	-0.6454	0.0373	0.0211	0.0142
0.90	-0.6019	0.0763	0.0673	0.0432

r/R \ x/c	0.50	0.60	0.70	0.75
0.10	0.0724	-0.1284	-0.1301	-0.1495
0.15	-0.0416	-0.1235	-0.1345	-0.1007
0.30	-0.1317	-0.0569	0.0058	-0.0096
0.40	-0.1152	-0.0380	0.0010	0.0097
0.50	-0.0234	-0.0043	0.0202	0.0559
0.70	0.0434	0.0171	0.0355	0.0478
0.80	0.0460	0.0200	0.0587	0.0846
0.90	0.0707	0.0490	0.0904	0.0731

COLL = 8  
TORQUE = 18.36  
PRESS = 14.718

RPM = 2400  
CT/S = 0.0987  
TEMP = 70.77

THRUST = 86.58  
CQ/S = 0.0105  
DENSITY = 0.002315

### Cpu

r/R x/c	0.125	0.20	0.30	0.40
0.06	-1.2922	-0.9100	-1.4038	-1.2046
0.15	-3.3036	-1.8667	-1.5514	-1.2460
0.25	-3.8646	-2.0954	-1.5946	-1.2880
0.35	-3.6220	-1.7655	-1.4074	-1.1269
0.45	-2.2009	-1.2941	-1.1281	-0.8411
0.55	-1.4465	-0.8223	-0.7657	-0.6370
0.65	-1.2117	-0.4896	-0.4811	-0.4168
0.75	-1.2912	-0.3207	-0.2388	-0.1995
0.85	****	-0.1787	-0.1202	-0.0546
0.95	-1.0208	0.0029	0.0385	0.0905

r/R x/c	0.50	0.60	0.70	0.75
0.06	-0.9102	-0.7256	-0.5801	-0.3892
0.15	-1.0970	-0.8988	-0.8082	-0.5781
0.25	-1.0547	-0.8373	-0.7667	-0.8342
0.35	-0.9102	-0.7689	-0.7510	-0.7573
0.45	-0.6789	-0.6592	-0.6351	-0.6113
0.55	-0.5960	-0.5794	-0.5012	-0.4578
0.65	-0.4122	-0.4014	-0.3784	-0.3356
0.75	-0.2557	-0.2424	-0.2888	-0.2458
0.85	-0.0991	-0.0775	-0.2054	-0.1658
0.95	0.1173	0.0611	0.0468	0.0377

### Cpl

r/R x/c	0.125	0.20	0.30	0.40
0.10	-0.4582	0.0441	0.0334	-0.0122
0.15	-0.6476	-0.1353	-0.2280	-0.1580
0.30	-0.7360	-0.2762	-0.2328	-0.1429
0.40	-0.7610	-0.2373	-0.1512	-0.1053
0.50	-0.7940	-0.2255	-0.0972	-0.0548
0.70	-0.6155	0.0122	-0.0083	0.0014
0.80	-0.7282	0.0388	0.0306	0.0153
0.90	-0.5821	0.0645	0.0613	0.0372

r/R x/c	0.50	0.60	0.70	0.75
0.10	0.0675	-0.1303	-0.1216	-0.1348
0.15	-0.0496	-0.1224	-0.1420	-0.0873
0.30	-0.1148	-0.0540	0.0244	0.0075
0.40	-0.0651	-0.0343	0.0115	0.0461
0.50	-0.0140	-0.0008	0.0316	0.0724
0.70	0.0475	0.0290	0.0475	0.0648
0.80	0.0529	0.0258	0.0728	0.1008
0.90	0.0644	0.0472	0.0983	0.0858

COLL = 12  
TORQUE = 7.17  
PRESS = 14.698

RPM = 1200  
CT/S = 0.1323  
TEMP = 67.45

THRUST = 29.18  
CQ/S = 0.0163  
DENSITY = 0.002327

### Cpu

r/R \ x/c	0.125	0.20	0.30	0.40
0.06	-1.5000	-0.9423	-1.6367	-1.3926
0.15	-3.2663	-2.0101	-1.7645	-1.3834
0.25	-3.9911	-2.2172	-1.8739	-1.4543
0.35	-3.6817	-1.8857	-1.5872	-1.2207
0.45	-2.4034	-1.5207	-1.3145	-1.0000
0.55	-1.5696	-0.8723	-0.9092	-0.7390
0.65	-1.3099	-0.5027	-0.5324	-0.4962
0.75	-1.3116	-0.3885	-0.3152	-0.2881
0.85	****	****	****	****
0.95	-0.951	0.0073	0.053	0.0658

r/R \ x/c	0.50	0.60	0.70	0.75
0.06	-1.1072	****	****	****
0.15	-1.3003	****	****	-0.5237
0.25	-1.2061	-0.7227	-0.5776	-0.6492
0.35	-1.0885	-0.8845	-0.7713	-0.8292
0.45	-0.8280	-0.9767	-0.8442	-0.8263
0.55	-0.6886	-0.8333	-0.7409	-0.6228
0.65	-0.4951	-0.5943	-0.5753	-0.4976
0.75	-0.3610	-0.6203	-0.5701	-0.4554
0.85	****	-0.4262	-0.3658	****
0.95	0.0646	-0.2870	-0.2486	****

### Cpl

r/R \ x/c	0.125	0.20	0.30	0.40
0.10	-0.2315	0.1453	0.1168	0.0472
0.15	-0.4918	-0.0013	-0.1441	-0.1039
0.30	-0.6425	-0.2079	-0.1959	-0.1110
0.40	-0.6554	-0.3028	-0.1582	-0.0877
0.50	-0.6406	-0.2020	-0.0729	-0.0303
0.70	-0.3961	0.0570	0.0052	0.0239
0.80	-0.5464	0.0481	0.0106	0.0333
0.90	-0.4889	0.0841	0.0735	0.0702

r/R \ x/c	0.50	0.60	0.70	0.75
0.10	0.1315	****	****	-0.0065
0.15	0.0007	0.1337	0.0825	0.0231
0.30	-0.1010	0.0621	0.0563	0.0012
0.40	-0.0686	****	****	****
0.50	-0.0060	0.0240	0.0517	****
0.70	0.0496	0.0950	0.1015	****
0.80	0.0553	****	****	****
0.90	0.0930	0.0991	0.0939	0.4094

COLL = 12  
TORQUE = 15.01  
PRESS = 14.698

RPM = 1800  
CT/S = 0.1287  
TEMP = 67.94

THRUST = 63.78  
CQ/S = 0.0151  
DENSITY = 0.002325

### Cpu

r/R \ x/c	0.125	0.20	0.30	0.40
0.06	-1.4609	-1.0716	-1.5806	-1.2858
0.15	-3.3010	-2.1262	-1.7099	-1.2984
0.25	-4.0575	-2.3222	-1.7874	-1.3172
0.35	-3.6455	-1.9184	-1.5665	-1.1581
0.45	-2.1855	-1.4085	-1.2439	-0.8952
0.55	-1.4635	-0.8528	-0.8483	-0.6806
0.65	-1.2313	-0.5113	-0.5224	-0.4543
0.75	-1.2887	-0.3701	-0.2960	-0.2529
0.85	****	****	****	****
0.95	-0.9465	0.0479	0.0583	0.0683

r/R \ x/c	0.50	0.60	0.70	0.75
0.06	-1.0046	****	****	****
0.15	-1.1629	****	****	-0.4968
0.25	-1.0859	-0.6864	-0.5370	-0.6338
0.35	-0.9437	-0.8347	-0.7541	-0.7808
0.45	-0.7128	-0.9267	-0.8154	-0.7929
0.55	-0.6238	-0.8168	-0.7191	-0.6016
0.65	-0.4420	-0.5678	-0.5467	-0.4674
0.75	-0.3065	-0.5877	-0.5329	-0.4093
0.85	****	-0.3974	-0.3377	****
0.95	0.0859	-0.2623	-0.2252	****

### Cpl

r/R \ x/c	0.125	0.20	0.30	0.40
0.10	-0.2993	0.1753	0.0681	0.0026
0.15	-0.5211	-0.0069	-0.2012	-0.1437
0.30	-0.6541	-0.1678	-0.2371	-0.1304
0.40	-0.7028	-0.2109	-0.1801	-0.1068
0.50	-0.6109	-0.1163	-0.0923	-0.0475
0.70	-0.4421	0.0931	-0.0242	0.0011
0.80	-0.5810	0.0728	0.0288	0.0139
0.90	-0.5656	0.1200	0.0700	0.0459

r/R \ x/c	0.50	0.60	0.70	0.75
0.10	0.1112	****	****	0.0189
0.15	-0.0109	0.1635	0.1197	0.0303
0.30	-0.1079	0.0455	0.0476	0.0079
0.40	-0.0677	****	****	****
0.50	-0.0035	0.0143	0.0781	****
0.70	0.0482	0.0882	0.1228	****
0.80	0.0510	0.2090	0.2964	****
0.90	0.0698	0.0916	0.0992	0.4246



COLL = 16  
 TORQUE = 1.59  
 PRESS = 14.698

RPM = 400  
 CT/S = 0.2440  
 TEMP = 70.10

THRUST = 5.95  
 CQ/S = 0.0325  
 DENSITY = 0.002315

### Cpu

$r/R$ $x/c$	0.125	0.20	0.30
0.06	-2.6250	-1.6003	-2.6046
0.15	-4.4136	-2.8923	-2.5312
0.25	-5.1600	-2.9474	-2.1447
0.35	-4.6344	-2.3689	-1.8691
0.45	-3.6251	-1.9854	-1.6418
0.55	-2.3999	-1.1271	-1.1720
0.65	-1.7080	-0.7997	-0.5509
0.75	-1.7034	-0.5630	-0.3366
0.85	-1.4826	-0.4349	-0.2106
0.95	-1.1033	-0.1506	-0.0411

### Cpl

$r/R$ $x/c$	0.125	0.20	0.30
0.10	0.1418	0.4434	0.5413
0.15	-0.0694	0.2354	0.2475
0.30	-0.3562	-0.1473	0.0413
0.40	****	****	-0.0505
0.50	-0.4949	-0.1968	0.0205
0.70	-0.3163	-0.0509	0.0507
0.80	-0.5864	-0.0444	0.0340
0.90	-0.5461	0.0112	0.0500

COLL = 16  
 TORQUE = 3.23  
 PRESS = 14.698

RPM = 600  
 CT/S = 0.2423  
 TEMP = 70.11

THRUST = 13.29  
 CQ/S = 0.0294  
 DENSITY = 0.002315

Cpu

$r/R$ $x/c$	0.125	0.20	0.30
0.06	-2.6938	-2.0966	-2.6194
0.15	-4.6713	-3.0975	-2.4313
0.25	-4.7520	-2.7604	-2.1541
0.35	-4.7590	-2.5520	-1.9141
0.45	-3.1151	-1.9970	-1.6183
0.55	-2.1063	-1.0845	-0.9956
0.65	-1.6882	-0.6881	-0.5788
0.75	-1.7687	-0.5268	-0.3717
0.85	-1.6538	-0.3510	-0.2178
0.95	-1.0414	-0.082	-0.001

Cpl

$r/R$ $x/c$	0.125	0.20	0.30
0.10	0.2260	0.4717	0.5786
0.15	-0.2303	0.3848	0.3166
0.30	-0.4782	0.0678	0.0637
0.40	****	****	-0.0501
0.50	-0.5054	-0.0061	0.0736
0.70	-0.4013	0.0839	0.0713
0.80	-0.7042	0.0528	0.0474
0.90	-0.5675	0.1065	0.0741

COLL = 16  
 TORQUE = 4.79  
 PRESS = 14.698

RPM = 800  
 CT/S = 0.2267  
 TEMP = 70.11

THRUST = 22.11  
 CQ/S = 0.0246  
 DENSITY = 0.002315

### Cpu

r/R \ x/c	0.125	0.20	0.30
0.06	-2.4394	-1.9866	-2.4972
0.15	-4.4338	-2.7741	-2.2889
0.25	-5.3673	-2.7349	-2.1661
0.35	-4.9304	-2.4983	-1.8123
0.45	-3.2322	-1.7404	-1.5022
0.55	-2.0817	-1.0022	-0.9375
0.65	-1.7370	-0.6468	-0.5696
0.75	-1.6555	-0.5102	-0.3616
0.85	-1.5644	-0.3304	-0.2096
0.95	-1.0449	-0.0251	-0.0158

### Cpl

r/R \ x/c	0.125	0.20	0.30
0.10	-0.0286	0.5160	0.5263
0.15	-0.3447	0.3621	0.2674
0.30	-0.5667	0.0730	0.0645
0.40	****	****	-0.0384
0.50	-0.5499	0.0027	0.0544
0.70	-0.4803	0.0858	0.0633
0.80	-0.6783	0.0682	0.0572
0.90	-0.5899	0.1157	0.0907

COLL = 16  
TORQUE = 10.54  
PRESS = 14.698

RPM = 1200  
CT/S = 0.1802  
TEMP = 69.26

THRUST = 39.61  
CQ/S = 0.0240  
DENSITY = 0.002319

### Cpu

r/R \ x/c	0.125	0.20	0.30	0.40
0.06	-2.3016	-1.8317	-2.5159	-2.1910
0.15	-4.4494	-2.8923	-2.3652	-1.8727
0.25	-5.1567	-2.9293	-2.2399	-1.7356
0.35	-4.6550	-2.4429	-1.8422	-1.4903
0.45	-3.1012	-1.8071	-1.6287	-1.0437
0.55	-2.0692	-1.0461	-0.9274	-0.7471
0.65	-1.7017	-0.6625	-0.5774	-0.5024
0.75	-1.6668	-0.5141	-0.3380	-0.2769
0.85	-1.6097	-0.3074	-0.1701	-0.1323
0.95	-1.5929	-0.0494	0.0151	0.0114

r/R \ x/c	0.50	0.60	0.70	0.75
0.06	-1.9424	-1.7203	-1.5756	-1.5365
0.15	-1.7418	-1.5698	-1.4338	-1.1920
0.25	-1.4995	-1.3488	-1.2148	-1.1652
0.35	-1.3305	-1.1481	-1.0770	-1.0583
0.45	-0.8279	-0.8341	-0.8487	-0.8397
0.55	-0.7151	-0.6719	-0.6461	-0.6284
0.65	-0.4896	-0.5084	-0.4815	-0.4405
0.75	-0.3119	-0.3634	-0.3619	-0.3383
0.85	-0.1304	-0.1623	-0.2207	-0.2201
0.95	0.0453	0.0530	0.0227	-0.0206

### Cpl

r/R \ x/c	0.125	0.20	0.30	0.40
0.10	-0.3278	0.4316	0.4930	0.4192
0.15	-0.7074	0.2839	0.2335	0.2390
0.30	-0.9577	0.0122	0.0590	0.0935
0.40	-1.0671	-0.1435	0.0061	0.0608
0.50	-0.8262	-0.0094	0.0573	0.0853
0.70	-0.5867	0.0640	0.0835	0.0724
0.80	-0.7269	0.0461	0.0611	0.0535
0.90	-0.7093	0.0778	0.0846	0.0530

r/R \ x/c	0.50	0.60	0.70	0.75
0.10	0.5025	0.3834	0.3683	0.3638
0.15	0.3354	0.2852	0.2917	0.3037
0.30	0.1238	0.1820	0.2116	0.2204
0.40	0.0853	0.1343	0.1580	0.1638
0.50	0.1136	0.1374	0.1459	0.1487
0.70	0.0998	0.0891	0.0974	0.1035
0.80	0.0787	0.0632	0.0848	0.0796
0.90	0.0739	0.0657	0.0809	0.0731

COLL = 16  
TORQUE = 23.25  
PRESS = 14.698

RPM = 1800  
CT/S = 0.1728  
TEMP = 69.60

THRUST = 85.40  
CQ/S = 0.0235  
DENSITY = 0.002317

Cpu

r/R x/c	0.125	0.20	0.30	0.40
0.06	-2.2776	-1.6851	-2.3326	-2.1327
0.15	-4.4835	-2.7131	-2.1732	-1.8110
0.25	-4.7947	-2.8064	-2.0942	-1.6705
0.35	-4.3517	-2.3235	-1.7497	-1.4022
0.45	-2.8531	-1.6832	-1.3491	-1.0034
0.55	-1.9663	-1.0669	-0.8945	-0.7371
0.65	-1.6042	-0.6675	-0.5661	-0.4696
0.75	-1.6688	-0.5226	-0.3541	-0.2508
0.85	-1.6480	-0.2932	-0.1865	-0.1311
0.95	-1.1842	-0.0416	0.0061	-0.0039

r/R x/c	0.50	0.60	0.70	0.75
0.06	-1.9167	-1.6711	-1.5295	-1.4729
0.15	-1.6982	-1.5075	-1.4202	****
0.25	-1.4459	-1.2969	-1.1782	-1.3362
0.35	-1.1718	-1.1142	-1.0469	-1.0393
0.45	-0.8247	-0.8061	-0.8176	-0.7948
0.55	-0.6923	-0.6541	-0.6303	-0.5974
0.65	-0.4629	-0.4780	-0.4637	-0.4178
0.75	-0.2769	-0.3238	-0.3408	-0.3194
0.85	-0.1056	-0.1359	-0.1954	-0.1965
0.95	0.0308	0.0390	0.0406	0.0095

Cpl

r/R x/c	0.125	0.20	0.30	0.40
0.10	-0.3608	0.3894	0.4363	0.4235
0.15	-0.8831	0.1738	0.1716	0.2393
0.30	-0.9756	-0.0806	0.0144	0.0964
0.40	-0.9970	-0.1703	-0.0062	0.0696
0.50	-0.8467	-0.1205	0.0262	0.0840
0.70	-0.6535	0.0350	0.0512	0.0701
0.80	-0.6891	0.0238	0.0347	0.0486
0.90	-0.6577	0.0496	0.0527	0.0424

r/R x/c	0.50	0.60	0.70	0.75
0.10	0.4894	0.3773	0.3697	0.3699
0.15	0.3283	0.2838	0.2886	0.3097
0.30	0.1215	0.1839	0.2173	0.2271
0.40	0.0822	0.1396	0.1628	0.1774
0.50	0.1123	0.1408	0.1530	0.1691
0.70	0.0996	0.0908	0.1018	0.1176
0.80	0.0735	0.0621	0.0910	0.0919
0.90	0.0611	0.0617	0.0846	0.0838

COLL = 18  
TORQUE = 11.94  
PRESS = 14.698

RPM = 1200  
CT/S = 0.1837  
TEMP = 66.03

THRUST = 40.64  
CQ/S = 0.0270  
DENSITY = 0.002334

### Cpu

r/R x/c	0.125	0.20	0.30	0.40
0.06	-2.2234	-1.7439	-2.5917	-2.3928
0.15	-4.2827	-2.8431	-2.3678	-2.0285
0.25	-5.1471	-2.9108	-2.2262	-1.8349
0.35	-5.0010	-2.3434	-1.8286	-1.5501
0.45	-3.1959	-1.7232	-1.5686	-1.0781
0.55	-2.1572	-1.0379	-0.9021	-0.7646
0.65	-1.8862	-0.6840	-0.5656	-0.4813
0.75	-1.8852	-0.5422	-0.3477	-0.2479
0.85	****	****	****	****
0.95	-1.4854	-0.0873	-0.0009	0.0025

r/R x/c	0.50	0.60	0.70	0.75
0.06	-2.0625	-1.8279	-1.3765	-1.7173
0.15	-1.8020	-1.6299	-1.1859	-1.4085
0.25	-1.5292	-1.3571	-0.9684	-1.2229
0.35	-1.3113	-1.1626	-0.8166	-1.0666
0.45	-0.8292	-0.8386	-0.5981	-0.8641
0.55	-0.7022	-0.6772	-0.4283	-0.6293
0.65	-0.4768	-0.5019	-0.2733	-0.4473
0.75	-0.2875	-0.3326	-0.1573	-0.3308
0.85	****	****	****	****
0.95	0.0315	0.0376	0.1286	-0.0157

### Cpl

r/R x/c	0.125	0.20	0.30	0.40
0.10	-0.4247	0.4515	0.5287	0.5056
0.15	-0.7575	0.2084	0.2609	0.3025
0.30	-1.0507	-0.0718	0.0710	0.1343
0.40	****	-0.1598	0.0339	0.0943
0.50	-0.9425	-0.0871	0.0593	0.1055
0.70	-0.7479	0.0152	0.0769	0.0829
0.80	-0.9407	0.0123	0.0589	0.0580
0.90	-0.8529	0.0573	0.0839	0.0514

r/R x/c	0.50	0.60	0.70	0.75
0.10	0.5477	0.4361	0.4942	0.4370
0.15	0.3752	0.3341	0.4206	0.3619
0.30	0.1494	0.2113	0.3347	0.2555
0.40	0.1084	0.1598	0.2787	0.1980
0.50	0.1218	0.1548	0.2664	0.1673
0.70	0.1058	0.1000	0.2125	0.1099
0.80	0.0740	0.0668	0.1919	0.0797
0.90	0.0611	0.0561	0.1780	0.0626

COLL = 18  
TORQUE = 26.52  
PRESS = 14.698

RPM = 1800  
CT/S = 0.1819  
TEMP = 66.22

THRUST = 90.49  
CQ/S = 0.0267  
DENSITY = 0.002333

### Cpu

r/R x/c	0.125	0.20	0.30	0.40
0.06	-2.3768	-1.6261	-2.4637	-2.2608
0.15	-4.7266	-2.6896	-2.2460	-1.9148
0.25	-5.2469	-2.7745	-2.1562	-1.7469
0.35	-5.0048	-2.2761	-1.8058	-1.4455
0.45	-3.0766	-1.6676	-1.3885	-1.0235
0.55	-2.2707	-1.1071	-0.9229	-0.7408
0.65	-1.8784	-0.7270	-0.5862	-0.4747
0.75	-2.0029	-0.5722	-0.3576	-0.2482
0.85	****	****	****	****
0.95	-1.7204	-0.0733	-0.007	-0.0131

r/R x/c	0.50	0.60	0.70	0.75
0.06	-2.0789	-1.7662	-1.6581	-1.6649
0.15	-1.7582	-1.5136	-1.4786	-1.3668
0.25	-1.4947	-1.3138	-1.2169	-1.2011
0.35	-1.1994	-1.0924	-1.0369	-1.0439
0.45	-0.8521	-0.8046	-0.8070	-0.8304
0.55	-0.7060	-0.6442	-0.6063	-0.5971
0.65	-0.4627	-0.4640	-0.4304	-0.4092
0.75	-0.2564	-0.2925	-0.2929	-0.2826
0.85	****	****	****	****
0.95	0.0182	0.0241	-0.0045	-0.0143

### Cpl

r/R x/c	0.125	0.20	0.30	0.40
0.10	-0.7098	0.2819	0.4473	0.4576
0.15	-0.8852	0.1269	0.1899	0.2673
0.30	-1.1383	-0.1513	0.0148	0.1133
0.40	****	-0.2669	-0.0014	0.0772
0.50	-0.9816	-0.1456	0.0314	0.0949
0.70	-0.7856	0.0057	0.0413	0.0698
0.80	-0.9964	-0.0070	0.0296	0.0482
0.90	-0.7569	0.0432	0.0583	0.0432

r/R x/c	0.50	0.60	0.70	0.75
0.10	0.5409	0.4283	0.4285	0.4342
0.15	0.3680	0.3277	0.3369	0.3580
0.30	0.1438	0.2097	0.2429	0.2579
0.40	0.1003	0.1604	0.1844	0.2053
0.50	0.1208	0.1560	0.1634	0.1771
0.70	0.1048	0.0998	0.0985	0.1188
0.80	0.0677	0.0655	0.0759	0.0848
0.90	0.0559	0.0554	0.0563	0.0632

COLL = 20  
 TORQUE = 2.17  
 PRESS = 14.698

RPM = 400  
 CT/S = 0.3254  
 TEMP = 66.68

THRUST = 7.98  
 CQ/S = 0.0442  
 DENSITY = 0.002330

### Cpu

r/R \ x/c	0.125	0.20	0.30
0.06	-3.2819	-2.2613	-2.9456
0.15	-5.2095	-3.2837	-2.4497
0.25	-5.6305	-2.8625	-2.1311
0.35	-5.2863	-2.4984	-1.8740
0.45	-3.9100	-2.2153	-1.5760
0.55	-2.6437	-1.1049	-0.8412
0.65	-2.3306	-0.7072	-0.5622
0.75	-1.9905	-0.5057	-0.3494
0.85	-1.9596	-0.3346	-0.2395
0.95	-1.2268	-0.0801	-0.0981

### Cpl

r/R \ x/c	0.125	0.20	0.30
0.10	0.0313	0.6600	0.7195
0.15	-0.0285	0.5049	0.4269
0.30	-0.5234	0.1668	0.1901
0.40	****	****	0.3141
0.50	-0.5691	0.0600	0.0981
0.70	-0.6183	0.1105	0.0864
0.80	-0.7760	0.1057	0.0743
0.90	-0.5754	0.1188	0.0555



COLL = 20  
 TORQUE = 3.96  
 PRESS = 14.698

RPM = 600  
 CT/S = 0.2585  
 TEMP = 67.45

THRUST = 14.25  
 CQ/S = 0.0359  
 DENSITY = 0.002327

Cpu

r/R \ x/c	0.125	0.20	0.30
0.06	-3.2252	-2.3223	-3.0178
0.15	-5.1825	-3.0449	-2.5849
0.25	-5.2408	-3.0532	-2.1832
0.35	-5.6054	-2.4626	-1.9460
0.45	-4.2232	-2.1750	-1.4602
0.55	-2.4235	-1.1158	-0.8348
0.65	-2.1029	-0.7611	-0.5327
0.75	-2.1264	-0.5236	-0.3530
0.85	-2.0216	-0.3674	-0.2346
0.95	-1.2244	-0.0972	-0.0534

Cpl

r/R \ x/c	0.125	0.20	0.30
0.10	-0.2235	0.6788	0.7107
0.15	-0.2461	0.4589	0.4689
0.30	-0.7591	0.1417	0.2136
0.40	****	****	0.2335
0.50	-0.7254	0.0423	0.1542
0.70	-0.8284	0.0765	0.0963
0.80	-0.9816	0.1187	0.0844
0.90	-0.7105	0.1145	0.0574

COLL = 20  
 TORQUE = 6.61  
 PRESS = 14.698

RPM = 800  
 CT/S = 0.2266  
 TEMP = 66.84

THRUST = 22.22  
 CQ/S = 0.0337  
 DENSITY = 0.002327

### Cpu

r/R \ x/c	0.125	0.20	0.30
0.06	-3.0752	-2.1058	-2.9867
0.15	-4.8827	-2.7659	-2.5870
0.25	-5.3279	-2.9065	-2.1197
0.35	-5.4354	-2.5008	-1.8331
0.45	-3.7319	-1.7742	-1.5616
0.55	-2.5149	-1.0148	-0.8788
0.65	-2.0684	-0.7310	-0.5315
0.75	-2.2710	-0.5494	-0.3417
0.85	-2.1006	-0.3954	-0.1970
0.95	-1.1953	-0.1196	-0.0092

### Cpl

r/R \ x/c	0.125	0.20	0.30
0.10	-0.0703	0.4952	0.6623
0.15	-0.2497	0.2954	0.4091
0.30	-0.8209	0.0155	0.1663
0.40	****	****	0.1687
0.50	-0.9791	-0.0062	0.1165
0.70	-0.9270	0.0041	0.0902
0.80	-1.0748	0.0140	0.0676
0.90	-0.8538	0.0606	0.0674

COLL = 20  
TORQUE = 13.87  
PRESS = 14.698

RPM = 1200  
CT/S = 0.2053  
TEMP = 67.29

THRUST = 45.28  
CQ/S = 0.0315  
DENSITY = 0.002327

Cpu

r/R \ x/c	0.125	0.20	0.30	0.40
0.06	-2.9816	-1.8904	-2.9723	-2.7079
0.15	-5.0709	-2.9141	-2.5718	-2.1651
0.25	-5.6406	-2.9349	-2.2934	-1.8715
0.35	-5.4818	-2.4635	-1.9017	-1.4872
0.45	-3.3905	-2.0151	-1.4816	-1.0239
0.55	-2.3896	-1.1231	-0.8901	-0.7249
0.65	-2.0124	-0.7688	-0.5642	-0.4386
0.75	-2.0617	-0.5857	-0.3454	-0.2400
0.85	-2.0259	-0.4118	-0.1949	-0.1520
0.95	-1.3246	-0.1333	-0.0156	-0.0216

r/R \ x/c	0.50	0.60	0.70	0.75
0.06	-2.4664	-2.2417	-1.9513	-1.8776
0.15	-1.9802	-1.7736	-1.6621	-1.4169
0.25	-1.6783	-1.3776	-1.3055	-1.2571
0.35	-1.1968	-1.2394	-1.0782	-1.0567
0.45	-0.8437	-0.8503	-0.8032	-0.7826
0.55	-0.6729	-0.6119	-0.5668	-0.5497
0.65	-0.4233	-0.4259	-0.3745	-0.3664
0.75	-0.2338	-0.3099	-0.2564	-0.2825
0.85	-0.1259	-0.2622	-0.2214	-0.2433
0.95	-0.0016	-0.1139	-0.0991	-0.0923

Cpl

r/R \ x/c	0.125	0.20	0.30	0.40
0.10	-0.2797	0.4365	0.6229	0.6187
0.15	-0.5150	0.2287	0.3765	0.4245
0.30	-0.9332	-0.0956	0.1564	0.2149
0.40	****	-0.1411	0.1305	0.1655
0.50	-0.8449	-0.1628	0.0952	0.1528
0.70	-0.7863	-0.0546	0.0793	0.0950
0.80	-0.9602	-0.0576	0.0612	0.0567
0.90	-0.7558	-0.0049	0.0616	0.0332

r/R \ x/c	0.50	0.60	0.70	0.75
0.10	0.6614	0.5950	0.5722	0.5735
0.15	0.4933	0.4651	0.4745	0.4798
0.30	0.2398	0.2946	0.3188	0.3304
0.40	0.1802	0.2319	0.2406	0.2589
0.50	0.1698	0.2004	0.1994	0.2088
0.70	0.1200	0.1035	0.1016	0.1165
0.80	0.0780	0.0518	0.0620	0.0705
0.90	0.0441	0.0018	0.0135	0.0269

COLL = 20  
TORQUE = 30.84  
PRESS = 14.698

RPM = 1800  
CT/S = 0.1973  
TEMP = 67.19

THRUST = 97.97  
CQ/S = 0.0311  
DENSITY = 0.002328

### Cpu

r/R \ x/c	0.125	0.20	0.30	0.40
0.06	-2.9209	-2.0870	-2.7986	-2.5445
0.15	-5.5029	-3.0113	-2.4374	-2.0293
0.25	-5.7464	-3.0585	-2.2562	-1.7796
0.35	-5.4184	-2.4993	-1.8818	-1.4094
0.45	-3.3753	-1.7058	-1.3530	-1.0068
0.55	-2.3998	-1.1408	-0.9060	-0.7074
0.65	-1.9427	-0.7478	-0.5787	-0.4310
0.75	-1.9612	-0.5874	-0.3749	-0.2424
0.85	-1.9609	-0.3749	-0.2098	-0.1603
0.95	-1.3248	-0.088	-0.0055	-0.033

r/R \ x/c	0.50	0.60	0.70	0.75
0.06	-2.4647	-1.9817	-1.9037	-1.9311
0.15	-1.9248	-1.4718	-1.6283	-1.3818
0.25	-1.5629	-1.1676	-1.2636	-1.3630
0.35	-1.1931	-1.1348	-1.0526	-1.0093
0.45	-0.8396	-0.7386	-0.7780	-0.7250
0.55	-0.6625	-0.5640	-0.5483	-0.5109
0.65	-0.4077	-0.4131	-0.3568	-0.3460
0.75	-0.2318	-0.3262	-0.2408	-0.2673
0.85	-0.1409	-0.2255	-0.2072	-0.2118
0.95	-0.0190	-0.0664	-0.0826	-0.0759

### Cpl

r/R \ x/c	0.125	0.20	0.30	0.40
0.10	-0.3708	0.4493	0.5519	0.5839
0.15	-0.6873	0.2621	0.3275	0.3991
0.30	-1.0408	-0.0513	0.1215	0.2020
0.40	****	-0.1508	0.0972	0.1506
0.50	-0.9282	-0.1156	0.0827	0.1464
0.70	-0.9191	-0.0138	0.0746	0.0939
0.80	-1.0680	-0.0157	0.0601	0.0546
0.90	-0.8730	0.0330	0.0629	0.0273

r/R \ x/c	0.50	0.60	0.70	0.75
0.10	0.6392	0.5806	0.5667	0.5747
0.15	0.4760	0.4545	0.4704	0.4828
0.30	0.2298	0.2893	0.3200	0.3348
0.40	0.1722	0.2262	0.2418	0.2632
0.50	0.1666	0.1979	0.2032	0.2176
0.70	0.1184	0.1063	0.1063	0.1288
0.80	0.0741	0.0551	0.0715	0.0812
0.90	0.0387	0.0106	0.0261	0.0356

COLL = 22  
TORQUE = 14.20  
PRESS = 14.698

RPM = 1200  
CT/S = 0.2000  
TEMP = 70.26

THRUST = 43.85  
CQ/S = 0.0324  
DENSITY = 0.002313

### Cpu

r/R \ x/c	0.125	0.20	0.30	0.40
0.06	-3.0537	-2.0993	-2.8021	-2.8714
0.15	-5.1179	-2.8878	-2.4114	-2.2721
0.25	-5.7857	-2.8875	-2.1797	-1.9428
0.35	-5.1226	-2.3504	-1.8294	-1.5252
0.45	-2.1798	****	-1.6483	-0.9436
0.55	-2.2179	-1.1226	-0.8865	-0.7402
0.65	-1.9222	-0.7528	-0.5817	-0.4486
0.75	-1.9219	-0.6098	-0.3731	-0.2656
0.85	****	****	****	****
0.95	****	****	-0.2711	-0.1493

r/R \ x/c	0.50	0.60	0.70	0.75
0.06	-2.6362	-2.2283	-2.0094	-2.0362
0.15	-2.0934	-1.8442	-1.7134	-1.6167
0.25	-1.6867	-1.4633	-1.3200	-1.3126
0.35	-1.2198	-1.1700	-1.0617	-1.0587
0.45	-0.8642	-0.8328	-0.7727	-0.7821
0.55	-0.6787	-0.6040	-0.5351	-0.5200
0.65	-0.4201	-0.3842	-0.3623	-0.3561
0.75	-0.2426	-0.2755	-0.2754	-0.2871
0.85	****	****	****	****
0.95	-0.0650	-0.1450	-0.1269	-0.1675

### Cpl

r/R \ x/c	0.125	0.20	0.30	0.40
0.10	0.4004	-0.2239	0.5645	0.7140
0.15	-0.3984	-0.4920	0.4107	0.4677
0.30	-0.9726	-0.0408	0.1428	0.2286
0.40	-1.0791	-0.1491	0.0560	0.1371
0.50	-0.8698	-0.0958	0.0746	0.1473
0.70	-0.7762	-0.0070	0.0622	0.0850
0.80	-0.9189	-0.0324	0.0339	0.0424
0.90	-0.8471	-0.0113	0.0509	0.0144

r/R \ x/c	0.50	0.60	0.70	0.75
0.10	0.8915	0.6426	0.6068	0.6230
0.15	0.5396	0.5088	0.5033	0.5205
0.30	0.2605	0.3197	0.3380	0.3553
0.40	0.2020	0.2365	0.2465	0.2754
0.50	0.1759	0.2070	0.2045	0.2147
0.70	0.1170	0.1010	0.0977	0.1135
0.80	0.0683	0.0368	0.0508	0.0595
0.90	0.0289	-0.0197	-0.0034	0.0062

COLL = 22  
TORQUE = 31.82  
PRESS = 14.698

RPM = 1800  
CT/S = 0.1988  
TEMP = 71.46

THRUST = 97.86  
CQ/S = 0.0323  
DENSITY = 0.002308

### Cpu

r/R \ x/c	0.125	0.20	0.30	0.40
0.06	-3.2507	-2.2141	-2.9860	-2.7726
0.15	-5.6306	-3.1207	-2.5783	-2.2000
0.25	-6.0620	-3.1707	-2.3510	-1.8609
0.35	-4.9707	-2.5138	-1.9396	-1.4561
0.45	-4.2295	****	-1.7406	-1.0114
0.55	-2.2737	-1.1318	-0.9118	-0.7194
0.65	-1.9822	-0.7095	-0.5788	-0.4355
0.75	-1.9312	-0.5789	-0.3840	-0.2589
0.85	****	****	****	****
0.95	****	****	-0.5304	-0.1902

r/R \ x/c	0.50	0.60	0.70	0.75
0.06	-2.6203	-2.1410	-1.9929	-2.0747
0.15	-2.0061	-1.7698	-1.6713	-1.5594
0.25	-1.5946	-1.4144	-1.2788	-1.2661
0.35	-1.2169	-1.1284	-1.0278	-1.0180
0.45	-0.8528	-0.8014	-0.7447	-0.7385
0.55	-0.6603	-0.5794	-0.5088	-0.4889
0.65	-0.4085	-0.3630	-0.3400	-0.3405
0.75	-0.2461	-0.2749	-0.2593	-0.2879
0.85	****	****	****	****
0.95	-0.0756	-0.1473	-0.1098	-0.1599

### Cpl

r/R \ x/c	0.125	0.20	0.30	0.40
0.10	-1.0936	-0.6218	0.3280	0.6475
0.15	-1.4008	-0.7345	0.1536	0.4554
0.30	-0.9225	-0.0180	0.1478	0.2252
0.40	-0.9969	-0.1142	0.1033	0.1521
0.50	-0.9276	-0.0855	0.0946	0.1488
0.70	-0.6996	0.0293	0.0824	0.0862
0.80	-0.9388	0.0175	0.0678	0.0383
0.90	-0.9116	-0.0110	0.0560	0.0098

r/R \ x/c	0.50	0.60	0.70	0.75
0.10	0.7804	0.6154	0.6044	0.6123
0.15	0.6052	0.4862	0.5014	0.5111
0.30	0.2541	0.3118	0.3404	0.3563
0.40	0.1900	0.2360	0.2569	0.2802
0.50	0.1763	0.2069	0.2142	0.2256
0.70	0.1174	0.1055	0.1089	0.1287
0.80	0.0688	0.0413	0.0679	0.0703
0.90	0.0302	-0.0093	0.0170	0.0220

COLL = 25  
 TORQUE = 2.63  
 PRESS = 14.698

RPM = 400  
 CT/S = 0.3207  
 TEMP = 67.43

THRUST = 7.86  
 CQ/S = 0.0535  
 DENSITY = 0.002328

### Cpu

r/R \ x/c	0.125	0.20	0.30
0.06	-3.7423	-3.0461	-3.5945
0.15	-6.7692	-3.6783	-2.9435
0.25	-6.7033	-3.4583	-2.2796
0.35	-5.7704	-2.8452	-2.2156
0.45	-4.9760	-2.4168	-1.4490
0.55	-2.4503	-1.3635	-0.9706
0.65	-2.1170	-0.9448	-0.7307
0.75	-1.9477	-0.8055	-0.6148
0.85	****	-0.6151	-0.4773
0.95	-1.5626	-0.24	-0.2713

### Cpl

r/R \ x/c	0.125	0.20	0.30
0.10	0.0845	0.7606	0.8922
0.15	-0.0161	0.4794	0.5987
0.30	-0.8004	0.0584	0.2537
0.40	****	-0.2604	0.1156
0.50	-0.9753	-0.1313	0.0929
0.70	-0.8950	0.0043	0.0647
0.80	-0.9202	-0.0890	-0.0158
0.90	-0.8866	-0.0277	-0.0591

COLL = 25  
 TORQUE = 5.47  
 PRESS = 14.698

RPM = 600  
 CT/S = 0.2569  
 TEMP = 67.23

THRUST = 14.16  
 CQ/S = 0.0496  
 DENSITY = 0.002327

### Cpu

$r/R$ $x/c$	0.125	0.20	0.30
0.06	-3.8633	-2.7692	-3.4364
0.15	-6.5687	-3.7596	-2.8380
0.25	-6.6874	-3.3560	-2.2841
0.35	-5.9763	-2.9094	-2.1779
0.45	-4.3471	-2.1245	-1.5005
0.55	-2.4450	-1.2241	-0.8977
0.65	-2.0250	-0.9158	-0.6033
0.75	-2.1215	-0.7828	-0.4666
0.85	-2.1372	-0.5591	-0.3038
0.95	-1.6892	-0.2643	-0.1058

### Cpl

$r/R$ $x/c$	0.125	0.20	0.30
0.10	0.1630	0.5718	0.7223
0.15	-0.2001	0.4139	0.5067
0.30	-0.8561	0.0138	0.2185
0.40	****	-0.3096	0.0819
0.50	-0.9575	-0.1329	0.0965
0.70	-0.8903	-0.0417	0.0524
0.80	-1.0800	-0.0527	0.0104
0.90	-1.0987	-0.0377	-0.0063



COLL = 25  
 TORQUE = 9.01  
 PRESS = 14.698

RPM = 800  
 CT/S = 0.2417  
 TEMP = 67.83

THRUST = 23.69  
 CQ/S = 0.0460  
 DENSITY = 0.002326

### Cpu

r/R \ x/c	0.125	0.20	0.30
0.06	-3.2875	-2.9454	-3.5641
0.15	-6.4025	-3.7855	-2.9780
0.25	-7.3313	-3.3927	-2.4447
0.35	-5.5067	-2.9208	-2.2677
0.45	-4.2280	-1.9969	-1.4597
0.55	-2.5318	-1.2271	-0.9218
0.65	-2.1186	-0.8642	-0.6194
0.75	-2.1719	-0.7277	-0.4290
0.85	-2.1692	-0.5243	-0.2873
0.95	-1.7515	-0.2261	-0.1148

### Cpl

r/R \ x/c	0.125	0.20	0.30
0.10	0.3076	0.6739	0.7900
0.15	-0.2885	0.4906	0.5562
0.30	-0.8867	0.0248	0.2212
0.40	****	-0.2132	0.1130
0.50	-0.9698	-0.1420	0.1062
0.70	-1.0108	-0.0295	0.0714
0.80	-1.0861	-0.0432	0.0195
0.90	-1.0584	-0.0324	0.0138

COLL = 25  
TORQUE = 20.04  
PRESS = 14.698

RPM = 1200  
CT/S = 0.2184  
TEMP = 67.04

THRUST = 48.21  
CQ/S = 0.0454  
DENSITY = 0.002329

### Cpu

r/R x/c	0.125	0.20	0.30	0.40
0.06	-3.6218	-2.7227	-3.4004	-3.1723
0.15	-6.3517	-3.7152	-2.8559	-2.4344
0.25	-6.7953	-3.6208	-2.4304	-1.9039
0.35	-6.0069	-2.8591	-2.0949	-1.5016
0.45	-3.9173	-1.9078	-1.4852	-1.0988
0.55	-2.6600	-1.2299	-0.9811	-0.7414
0.65	-2.2551	-0.8500	-0.6328	-0.4623
0.75	-2.2393	-0.7296	-0.4394	-0.3264
0.85	-2.2300	-0.5086	-0.2806	-0.2541
0.95	-1.9549	-0.2773	-0.0955	-0.1067

r/R x/c	0.50	0.60	0.70	0.75
0.06	-3.1570	-2.4556	-2.4197	-2.4564
0.15	-2.1953	-1.9339	-1.8774	-1.7277
0.25	-1.6425	-1.3234	-1.2873	-1.2440
0.35	-1.3105	-0.9339	-1.0569	-0.9869
0.45	-0.9197	-0.7500	-0.7517	-0.8124
0.55	-0.6888	-0.6594	-0.5565	-0.6696
0.65	-0.4753	-0.5144	-0.4642	-0.6149
0.75	-0.3579	-0.3957	-0.4429	-0.5568
0.85	-0.2831	-0.4014	-0.4152	-0.5018
0.95	-0.0718	-0.2039	-0.2121	-0.3117

### Cpl

r/R x/c	0.125	0.20	0.30	0.40
0.10	-0.3636	0.5103	0.7085	0.7140
0.15	-0.9484	0.2985	0.4609	0.5354
0.30	-1.4608	-0.1055	0.1850	0.2812
0.40	****	-0.2911	0.0889	0.1964
0.50	-1.4802	-0.2026	0.0825	0.1690
0.70	-1.2610	-0.1253	0.0436	0.0802
0.80	-1.3470	-0.1376	0.0146	0.0287
0.90	-1.3110	-0.1019	0.0066	-0.0199

r/R x/c	0.50	0.60	0.70	0.75
0.10	0.7901	0.7301	0.7156	0.7125
0.15	0.6265	0.5929	0.6053	0.6021
0.30	0.3231	0.3656	0.3878	0.3964
0.40	0.2411	0.2826	0.2922	0.2926
0.50	0.2014	0.2224	0.2186	0.2269
0.70	0.1133	0.0826	0.0716	0.0962
0.80	0.0519	0.0104	0.0119	0.0268
0.90	-0.0053	-0.0751	-0.0726	-0.0531

COLL = 25  
TORQUE = 45.06  
PRESS = 14.698

RPM = 1800  
CT/S = 0.2096  
TEMP = 66.89

THRUST = 104.14  
CQ/S = 0.0453  
DENSITY = 0.002330

### Cpu

r/R x/c	0.125	0.20	0.30	0.40
0.06	-3.8106	-2.5734	-3.2559	-3.1775
0.15	-6.8158	-3.4790	-2.7491	-2.4242
0.25	-7.1763	-3.5677	-2.4347	-1.9531
0.35	-6.1655	-2.9317	-2.0019	-1.5578
0.45	-3.7106	-1.9379	-1.4490	-1.0961
0.55	-2.6644	-1.3450	-0.9895	-0.7352
0.65	-2.2339	-0.9116	-0.6620	-0.4632
0.75	-2.2449	-0.7242	-0.4680	-0.3307
0.85	-2.2172	-0.5008	-0.2887	-0.2695
0.95	-1.9652	-0.2563	-0.078	-0.1232

r/R x/c	0.50	0.60	0.70	0.75
0.06	-2.9944	-2.5032	-2.3918	-2.4488
0.15	-2.1235	-1.9363	-1.8395	-1.6795
0.25	-1.6166	-1.4007	-1.2992	-1.2215
0.35	-1.2692	-1.0402	-1.0378	-0.9766
0.45	-0.8925	-0.8384	-0.7259	-0.7469
0.55	-0.6659	-0.6065	-0.5379	-0.6106
0.65	-0.4572	-0.4015	-0.4560	-0.5855
0.75	-0.3502	-0.3073	-0.4137	-0.5197
0.85	-0.2831	-0.3221	-0.3955	-0.4782
0.95	-0.0894	-0.1626	-0.1912	-0.2777

### Cpl

r/R x/c	0.125	0.20	0.30	0.40
0.10	-0.0915	0.5687	0.6252	0.6960
0.15	-0.7755	0.3012	0.3941	0.5125
0.30	-1.2677	-0.1230	0.1361	0.2645
0.40	****	-0.2816	0.0660	0.1872
0.50	-1.3400	-0.2439	0.0544	0.1566
0.70	-1.0674	-0.1304	0.0300	0.0740
0.80	-1.2845	-0.1576	0.0104	0.0212
0.90	-1.2747	-0.1080	0.0080	-0.0263

r/R x/c	0.50	0.60	0.70	0.75
0.10	0.7536	0.7237	0.6951	0.6865
0.15	0.5964	0.5836	0.5857	0.5845
0.30	0.3060	0.3649	0.3808	0.3909
0.40	0.2212	0.2851	0.2821	0.3014
0.50	0.1896	0.2301	0.2181	0.2393
0.70	0.1107	0.0943	0.0817	0.1095
0.80	0.0498	0.0208	0.0284	0.0558
0.90	-0.0087	-0.0568	-0.0459	-0.0334

COLL = 26  
 TORQUE = 2.82  
 PRESS = 14.698

RPM = 400  
 CT/S = 0.2343  
 TEMP = 67.37

THRUST = 5.74  
 CQ/S = 0.0575  
 DENSITY = 0.002325

Cpu

r/R \ x/c	0.20	0.30	0.40	0.50
0.06	-3.0943	-3.6899	-3.3215	-3.1640
0.15	-3.8608	-2.9577	-2.6544	-2.3633
0.25	-3.6609	-2.3499	-2.2746	-1.7601
0.35	-2.8410	-2.2030	-1.5816	-1.3027
0.45	-2.5588	-1.5305	-1.0386	-0.9421
0.55	-1.4647	-1.0290	-0.7395	-0.7234
0.65	-1.0498	-0.7192	-0.4873	-0.5206
0.75	-0.8109	-0.6043	-0.3210	-0.3634
0.85	****	****	****	****
0.95	****	0.0367	-0.3229	-0.0511

Cpl

r/R \ x/c	0.20	0.30	0.40	0.50
0.10	****	1.2046	0.6426	0.8489
0.15	0.4621	0.6139	0.6115	0.6490
0.30	0.0369	0.2398	0.3151	0.3350
0.40	****	0.2793	0.4161	0.2903
0.50	-0.2302	0.0983	0.1543	0.1962
0.70	-0.1658	0.0067	0.0451	0.0948
0.80	-0.0754	-0.0274	-0.0098	0.0294
0.90	-0.0108	-0.0838	-0.0852	-0.0368

COLL = 26  
 TORQUE = 5.75  
 PRESS = 14.698

RPM = 600  
 CT/S = 0.2234  
 TEMP = 67.53

THRUST = 12.30  
 CQ/S = 0.0522  
 DENSITY = 0.002324

Cpu

r/R \ x/c	0.20	0.30	0.40	0.50
0.06	-2.8081	-3.6396	-3.3377	-3.3529
0.15	-3.7938	-3.0097	-2.5154	-2.3633
0.25	-3.5018	-2.5320	-2.1716	-1.7307
0.35	-3.0587	-2.2576	-1.5171	-1.3547
0.45	-2.2130	-1.5277	-1.0999	-0.9460
0.55	-1.3231	-0.9258	-0.7189	-0.7174
0.65	-1.0098	-0.6319	-0.4782	-0.5259
0.75	-0.7928	-0.4789	-0.3269	-0.3860
0.85	****	****	****	****
0.95	****	0.1473	-0.1235	-0.0502

Cpl

r/R \ x/c	0.20	0.30	0.40	0.50
0.10	****	1.1495	0.7909	0.9276
0.15	0.3820	0.5342	0.5832	0.6041
0.30	-0.0359	0.2277	0.3041	0.3333
0.40	****	0.2305	0.2966	0.2603
0.50	-0.2003	0.0806	0.1761	0.1966
0.70	-0.1297	0.0230	0.0701	0.1134
0.80	-0.1304	-0.0019	0.0184	0.0346
0.90	-0.0756	-0.0382	-0.0332	-0.0155

COLL = 26  
 TORQUE = 9.68  
 PRESS = 14.698

RPM = 800  
 CT/S = 0.2110  
 TEMP = 67.49

THRUST = 20.66  
 CQ/S = 0.0495  
 DENSITY = 0.002324

Cpu

r/R \ x/c	0.20	0.30	0.40	0.50
0.06	-2.5011	-3.6521	-3.2844	-3.1969
0.15	-3.6676	-3.0699	-2.5831	-2.2447
0.25	-3.5393	-2.5954	-2.0753	-1.7534
0.35	-3.0142	-2.3264	-1.5538	-1.3500
0.45	-2.1204	-1.5212	-1.1089	-0.9334
0.55	-1.3417	-0.9829	-0.7507	-0.7250
0.65	-0.9897	-0.6597	-0.4843	-0.5298
0.75	-0.8310	-0.4446	-0.3285	-0.3885
0.85	****	****	****	****
0.95	****	0.1131	-0.1455	-0.1210

Cpl

r/R \ x/c	0.20	0.30	0.40	0.50
0.10	****	1.1190	0.7866	0.8402
0.15	0.2622	0.5242	0.5340	0.6155
0.30	-0.1664	0.2065	0.2871	0.3310
0.40	-0.1646	0.1893	0.2535	0.2488
0.50	-0.3308	0.0806	0.1599	0.1956
0.70	-0.2007	0.0236	0.0766	0.1006
0.80	-0.2122	-0.0008	0.0164	0.0384
0.90	-0.1393	-0.0126	-0.0366	-0.0193

COLL = 26  
TORQUE = 21.25  
PRESS = 14.698

RPM = 1200  
CT/S = 0.2047  
TEMP = 68.21

THRUST = 45.03  
CQ/S = 0.0483  
DENSITY = 0.002321

### Cpu

r/R \ x/c	0.125	0.20	0.30	0.40
0.06	-3.8078	-2.7004	-3.5713	-3.2336
0.15	-6.4366	-3.6589	-2.9509	-2.4596
0.25	-7.0170	-3.4840	-2.5798	-2.0295
0.35	-6.5083	-2.9672	-2.2132	-1.5578
0.45	-4.0814	-2.1024	-1.5349	-1.1200
0.55	-2.9072	-1.3968	-1.0136	-0.7610
0.65	-2.3995	-0.9681	-0.6757	-0.4915
0.75	-2.4530	-0.8108	-0.4753	-0.3447
0.85	****	****	****	****
0.95	****	****	-0.025	-0.2067

r/R \ x/c	0.50	0.60	0.70	0.75
0.06	-3.2841	-2.4166	-2.4528	-2.6348
0.15	-2.2445	-1.9929	-1.8948	-1.7828
0.25	-1.7471	-1.4119	-1.3774	-1.3125
0.35	-1.3221	-1.0330	-1.0457	-0.9825
0.45	-0.9248	-0.7602	-0.7572	-0.7782
0.55	-0.6981	-0.6258	-0.6302	-0.6624
0.65	-0.4952	-0.4905	-0.5512	-0.5792
0.75	-0.3838	-0.4361	-0.5060	-0.5484
0.85	****	****	****	****
0.95	-0.2127	-0.3344	-0.3932	-0.3783

### Cpl

r/R \ x/c	0.125	0.20	0.30	0.40
0.10	****	****	0.9060	0.7183
0.15	-0.8975	0.2880	0.4167	0.5230
0.30	-1.5180	-0.1651	0.1474	0.2720
0.40	-1.7516	-0.2555	0.0875	0.2118
0.50	-1.6168	-0.3074	0.0456	0.1544
0.70	-1.4350	-0.2260	0.0145	0.0611
0.80	-1.5475	-0.2255	-0.0138	0.0079
0.90	-1.4720	-0.1569	-0.0159	-0.0337

r/R \ x/c	0.50	0.60	0.70	0.75
0.10	0.7644	0.7521	0.7251	0.7401
0.15	0.6166	0.5954	0.6121	0.6020
0.30	0.3234	0.3712	0.3940	0.3972
0.40	0.2387	0.2751	0.2825	0.2913
0.50	0.1967	0.2195	0.2152	0.2206
0.70	0.1053	0.0771	0.0692	0.0856
0.80	0.0382	-0.0078	-0.0023	0.0128
0.90	-0.0190	-0.0882	-0.0892	-0.0696

COLL = 26  
TORQUE = 47.51  
PRESS = 14.698

RPM = 1800  
CT/S = 0.2049  
TEMP = 68.34

THRUST = 101.41  
CQ/S = 0.0480  
DENSITY = 0.002320

### Cpu

r/R \ x/c	0.125	0.20	0.30	0.40
0.06	-3.8059	-2.5321	-3.4569	-3.1115
0.15	-6.9014	-3.4884	-2.9466	-2.3880
0.25	-7.2776	-3.5974	-2.5304	-1.9517
0.35	-6.4596	-3.0106	-2.1389	-1.5268
0.45	-4.1945	-2.1038	-1.5484	-1.0876
0.55	-3.1481	-1.4816	-1.0504	-0.7526
0.65	-2.5446	-1.0395	-0.7123	-0.4890
0.75	-2.5280	-0.8317	-0.5087	-0.3507
0.85	****	****	****	****
0.95	****	****	-0.041	-0.1787

r/R \ x/c	0.50	0.60	0.70	0.75
0.06	-3.0501	-2.4582	-2.4266	-2.5352
0.15	-2.2087	-2.3484	-1.8697	-1.6992
0.25	-1.7224	-1.3800	-1.3541	-1.2890
0.35	-1.2940	-1.0081	-1.0179	-0.9787
0.45	-0.8968	-0.7188	-0.7226	-0.7905
0.55	-0.6825	-0.6066	-0.5720	-0.6519
0.65	-0.4853	-0.4623	-0.4925	-0.6050
0.75	-0.3737	-0.3866	-0.4633	-0.5540
0.85	****	****	****	****
0.95	-0.1972	-0.2930	-0.3625	-0.3737

### Cpl

r/R \ x/c	0.125	0.20	0.30	0.40
0.10	****	****	0.8231	0.7212
0.15	-1.2828	0.1586	0.4134	0.4970
0.30	-1.9074	-0.2846	0.1254	0.2502
0.40	-2.0769	-0.4092	0.0739	0.1873
0.50	-1.8376	-0.4311	0.0330	0.1523
0.70	-1.5756	-0.3001	-0.0051	0.0614
0.80	-1.6725	-0.2938	-0.0228	0.0078
0.90	-1.5581	-0.2211	-0.0151	-0.0405

r/R \ x/c	0.50	0.60	0.70	0.75
0.10	0.7618	0.7247	0.7032	0.7086
0.15	0.5995	0.5885	0.6061	0.6008
0.30	0.3123	0.3682	0.3923	0.3994
0.40	0.2256	0.2742	0.2836	0.2988
0.50	0.1964	0.2235	0.2237	0.2333
0.70	0.1053	0.0894	0.0801	0.1041
0.80	0.0373	0.0090	0.0184	0.0465
0.90	-0.0179	-0.0648	-0.0599	-0.0476



COLL = 27  
 TORQUE = 2.80  
 PRESS = 14.698

RPM = 400  
 CT/S = 0.2693  
 TEMP = 71.04

THRUST = 6.56  
 CQ/S = 0.0575  
 DENSITY = 0.002312

### Cpu

r/R \ x/c	0.125	0.20	0.30
0.06	-4.3753	-2.4589	-3.7171
0.15	-6.4027	-3.2408	-3.1185
0.25	-7.6102	-3.2221	-2.4255
0.35	-6.3795	-2.9501	-2.4222
0.45	-6.2329	-2.5509	-1.5472
0.55	-3.3161	-1.4834	-1.0674
0.65	-2.7622	-1.0545	-0.7552
0.75	-2.6516	-0.8715	-0.6453
0.85	****	****	****
0.95	****	****	****

### Cpl

r/R \ x/c	0.125	0.20	0.30
0.10	-0.4413	0.3833	0.8224
0.15	-0.7734	0.1791	0.5396
0.30	-1.7871	-0.2339	0.1697
0.40	****	****	****
0.50	-1.7608	-0.3185	0.0500
0.70	-1.4387	-0.2355	-0.0232
0.80	-1.6916	-0.2907	-0.0982
0.90	-1.6323	-0.1984	-0.1094

COLL = 27  
 TORQUE = 5.82  
 PRESS = 14.698

RPM = 600  
 CT/S = 0.2413  
 TEMP = 71.03

THRUST = 13.22  
 CQ/S = 0.0532  
 DENSITY = 0.002312

Cpu

$\begin{matrix} r/R \\ x/c \end{matrix}$	0.125	0.20	0.30
0.06	-4.0721	-3.1063	-3.9956
0.15	-6.5988	-3.7588	-3.2767
0.25	-6.9617	-3.5904	-2.5947
0.35	-6.5102	-3.0855	-2.5324
0.45	-4.9799	-2.0704	-1.6086
0.55	-2.8388	-1.3216	-1.0109
0.65	-2.4685	-1.0739	-0.7057
0.75	-2.4361	-0.8513	-0.5273
0.85	****	****	****
0.95	****	****	****

Cpl

$\begin{matrix} r/R \\ x/c \end{matrix}$	0.125	0.20	0.30
0.10	-0.3108	0.5681	0.8004
0.15	-0.8463	0.3017	0.5802
0.30	-1.4170	-0.1475	0.2299
0.40	****	****	****
0.50	-1.5921	-0.2721	0.0580
0.70	-1.4572	-0.2087	0.0079
0.80	-1.5849	-0.2020	-0.0542
0.90	-1.5458	-0.1249	-0.0479

COLL = 27  
 TORQUE = 10.72  
 PRESS = 14.698

RPM = 800  
 CT/S = 0.2291  
 TEMP = 71.04

THRUST = 22.31  
 CQ/S = 0.0550  
 DENSITY = 0.002312

Cpu

r/R \ x/c	0.125	0.20	0.30
0.06	-4.1271	-3.2042	-4.0380
0.15	-7.0080	-4.0351	-3.3070
0.25	-7.2409	-3.5836	-2.7055
0.35	-6.5491	-3.3593	-2.5369
0.45	-4.3346	-2.1437	-1.5822
0.55	-2.8546	-1.3423	-1.0473
0.65	-2.3663	-0.9764	-0.6867
0.75	-2.3476	-0.8114	-0.4794
0.85	-2.6704	****	****
0.95	****	****	****

Cpl

r/R \ x/c	0.125	0.20	0.30
0.10	0.2914	0.6372	0.8559
0.15	-0.6540	0.4170	0.5681
0.30	-1.2531	-0.0852	0.2092
0.40	****	-0.4536	-0.0795
0.50	-1.2671	-0.2808	0.0643
0.70	-1.2547	-0.1300	0.0090
0.80	-1.3967	-0.1475	-0.0510
0.90	-1.3060	-0.1235	-0.0274

COLL = 27  
 TORQUE = 23.40  
 PRESS = 14.698

RPM = 1200  
 CT/S = 0.2158  
 TEMP = 70.11

THRUST = 47.36  
 CQ/S = 0.0533  
 DENSITY = 0.002316

Cpu

r/R \ x/c	0.125	0.20	0.30	0.50
0.06	-4.4621	-3.1712	-3.9988	-3.2876
0.15	-7.0953	-4.0705	-3.2958	-2.2744
0.25	-7.6170	-3.9610	-2.7995	-1.7771
0.35	-6.6570	-3.4306	-2.3482	-1.3583
0.45	-4.0772	-2.0656	-1.5937	-0.9509
0.55	-2.8671	-1.3848	-1.0566	-0.7295
0.65	-2.4155	-0.9868	-0.7066	-0.5231
0.75	-2.4901	-0.8071	-0.5094	-0.4117
0.85	****	****	****	****
0.95	****	****	****	0.018

r/R \ x/c	0.60	0.70	0.75
0.06	-2.6649	-2.5212	-2.7179
0.15	-2.0877	-1.8754	-1.8516
0.25	-1.5311	-1.3341	-1.3187
0.35	-1.1054	-1.0103	-1.0404
0.45	-0.7973	-0.7961	-0.8259
0.55	-0.6596	-0.6855	-0.7072
0.65	-0.5718	-0.5991	-0.6453
0.75	-0.5310	-0.5506	-0.5809
0.85	****	****	****
0.95	-0.3978	-0.3246	-0.4013

Cpl

r/R \ x/c	0.125	0.20	0.30	0.50
0.10	0.0333	0.6021	0.8095	0.7829
0.15	-0.4214	0.3642	0.5619	0.6207
0.30	-1.1710	-0.1217	0.2262	0.3232
0.40	-1.5414	-0.4198	0.0137	0.2079
0.50	-1.2289	-0.2939	0.0785	0.1859
0.70	-1.1146	-0.1799	0.0380	0.0913
0.80	-1.3986	-0.1937	-0.0183	0.0279
0.90	-1.2650	-0.1285	-0.0124	-0.0297

r/R \ x/c	0.60	0.70	0.75
0.10	0.7591	0.7266	0.7133
0.15	0.6172	0.6188	0.5917
0.30	0.3802	0.3938	****
0.40	0.2844	0.2843	0.2965
0.50	0.2221	0.2066	0.2197
0.70	0.0693	0.0585	0.0808
0.80	-0.0134	-0.0067	0.0076
0.90	-0.1110	-0.0997	-0.0872

COLL = 27  
TORQUE = 52.97  
PRESS = 14.698

RPM = 1800  
CT/S = 0.2108  
TEMP = 70.68

THRUST = 103.96  
CQ/S = 0.0537  
DENSITY = 0.002313

Cpu

r/R \ x/c	0.125	0.20	0.30	0.50
0.06	-4.0025	-2.6362	-3.5917	-3.0335
0.15	-6.8966	-3.6566	-3.0232	-2.2884
0.25	-7.4488	-3.6273	-2.6528	-1.7781
0.35	-6.7425	-3.0988	-2.1771	-1.3282
0.45	-3.9828	-2.0961	-1.5649	-0.9210
0.55	-2.8928	-1.4855	-1.0745	-0.7047
0.65	-2.4521	-1.0370	-0.7276	-0.5099
0.75	-2.4785	-0.8482	-0.5251	-0.4124
0.85	****	****	****	****
0.95	****	-0.2843	-0.0725	-0.1191

r/R \ x/c	0.60	0.70	0.75
0.06	-2.6369	-2.4755	-2.5989
0.15	-2.1001	-1.8481	-1.7042
0.25	-1.4852	-1.3233	-1.2304
0.35	-1.0465	-0.9938	-0.9280
0.45	-0.7573	-0.7594	-0.8069
0.55	-0.6262	-0.6575	-0.7036
0.65	-0.4768	-0.5644	-0.6537
0.75	-0.4330	-0.5188	-0.5807
0.85	****	****	****
0.95	-0.3208	-0.3080	-0.4004

Cpl

r/R \ x/c	0.125	0.20	0.30	0.50
0.10	-0.3184	0.4434	0.6887	0.7932
0.15	-0.8598	0.1542	0.4274	0.6182
0.30	-1.5288	-0.2659	0.1320	0.3217
0.40	-1.6992	-0.4595	0.0072	0.2183
0.50	-1.5473	-0.3873	0.0177	0.1876
0.70	-1.3778	-0.2653	-0.0054	0.0938
0.80	-1.5105	-0.2683	-0.0369	0.0291
0.90	-1.4860	-0.1994	-0.0249	-0.0358

r/R \ x/c	0.60	0.70	0.75
0.10	0.7438	0.7135	0.6680
0.15	0.6031	0.6036	0.5788
0.30	0.3740	0.3861	****
0.40	0.2831	0.2882	0.3004
0.50	0.2256	0.2168	0.2353
0.70	0.0747	0.0679	0.0948
0.80	-0.0019	0.0089	0.0378
0.90	-0.0788	-0.0743	-0.0640

COLL = 28  
 TORQUE = 3.37  
 PRESS = 14.698

RPM = 400  
 CT/S = 0.3250  
 TEMP = 69.01

THRUST = 7.94  
 CQ/S = 0.0689  
 DENSITY = 0.002320

### Cpu

$r/R$ $x/c$	0.125	0.20	0.30
0.06	-4.7902	-3.1285	-3.5914
0.15	-6.5254	-4.0122	-3.0685
0.25	-7.5627	-3.4946	-2.4282
0.35	-6.5493	-3.1331	-2.3158
0.45	-5.9576	-2.6895	-1.5178
0.55	-2.8576	-1.5035	-0.9924
0.65	-2.3172	-1.1930	-0.8149
0.75	-2.2725	-1.0936	-0.6164
0.85	-2.5242	****	****
0.95	-1.905	-0.3344	-0.3135

### Cpl

$r/R$ $x/c$	0.125	0.20	0.30
0.10	0.3874	0.6145	0.7828
0.15	-0.4037	0.4040	0.5240
0.30	-1.0730	-0.0785	0.1958
0.40	****	****	-0.0121
0.50	-1.0790	-0.2168	0.0208
0.70	-1.1659	-0.1260	-0.0314
0.80	-1.4153	-0.1972	-0.0836
0.90	-1.5109	-0.1138	-0.1059

COLL = 28  
 TORQUE = 6.93  
 PRESS = 14.698

RPM = 600  
 CT/S = 0.2617  
 TEMP = 69.27

THRUST = 14.38  
 CQ/S = 0.0630  
 DENSITY = 0.002319

### Cpu

$r/R$ $x/c$	0.125	0.20	0.30
0.06	-4.3217	-3.3223	-3.9728
0.15	-6.5552	-4.2478	-3.1644
0.25	-7.3295	-3.6160	-2.6535
0.35	-6.8218	-3.3611	-2.4736
0.45	-5.4290	-2.1865	-1.5494
0.55	-3.0797	-1.3898	-0.9908
0.65	-2.5526	-1.0472	-0.6788
0.75	-2.4833	-0.9786	-0.5288
0.85	-2.5401	****	****
0.95	-1.9646	-0.3110	-0.1848

### Cpl

$r/R$ $x/c$	0.125	0.20	0.30
0.10	-0.6033	0.6561	0.8232
0.15	-0.9441	0.4207	0.5757
0.30	-1.7497	-0.0812	0.2191
0.40	****	****	-0.0124
0.50	-1.6050	-0.2808	0.0615
0.70	-1.7449	-0.1409	0.0096
0.80	-1.7921	-0.2274	-0.0515
0.90	-1.6048	-0.1088	-0.0481

COLL = 28  
 TORQUE = 11.57  
 PRESS = 14.698

RPM = 800  
 CT/S = 0.2249  
 TEMP = 69.69

THRUST = 21.95  
 CQ/S = 0.0593  
 DENSITY = 0.002317

Cpu

$r/R$ $x/c$	0.125	0.20	0.30
0.06	-4.1638	-3.0005	-4.0094
0.15	-6.8906	-4.1002	-3.3658
0.25	-7.1342	-3.7814	-2.9491
0.35	-6.9172	-3.1735	-2.5874
0.45	-5.0519	-2.1139	-1.5684
0.55	-3.0353	-1.4315	-1.0451
0.65	-2.5589	-1.0488	-0.6977
0.75	-2.5522	-0.9083	-0.4995
0.85	-2.5267	-0.5624	-0.2236
0.95	-2.0378	-0.3819	-0.1686

Cpl

$r/R$ $x/c$	0.125	0.20	0.30
0.10	-0.6173	0.5086	0.9218
0.15	-1.1484	0.2260	0.6659
0.30	-1.8168	-0.2043	0.2718
0.40	****	****	0.0037
0.50	-1.7791	-0.3530	0.0871
0.70	-1.6731	-0.2582	0.0207
0.80	-1.7635	-0.2882	-0.0408
0.90	-1.6578	-0.1950	-0.0472



COLL = 28  
TORQUE = 24.96  
PRESS = 14.698

RPM = 1200  
CT/S = 0.2199  
TEMP = 71.64

THRUST = 48.09  
CQ/S = 0.0571  
DENSITY = 0.002308

### Cpu

r/R x/c	0.125	0.20	0.30	0.40
0.06	-3.7127	-2.8422	-3.5705	-3.6120
0.15	-6.7717	-3.8900	-2.9715	-2.7684
0.25	-7.4953	-3.8312	-2.5827	-2.1979
0.35	-7.0658	-3.2209	-2.1656	-1.6766
0.45	-4.7367	-2.2163	-1.5401	-1.1713
0.55	-3.2768	-1.4354	-1.0535	-0.7849
0.65	-2.7054	-1.0237	-0.7129	-0.5165
0.75	-2.6559	-0.8702	-0.5103	-0.3842
0.85	-2.6621	-0.5739	-0.2726	-0.3057
0.95	-2.2721	-0.3683	-0.1318	-0.1877

r/R x/c	0.50	0.60	0.70	0.75
0.06	-3.3440	-2.7921	-2.5749	-2.6428
0.15	-2.3166	-2.1529	-1.8111	-1.8882
0.25	-1.8117	-1.6149	-1.2692	-1.3704
0.35	-1.3747	-1.1644	-1.0088	-1.1125
0.45	-0.9825	-0.8393	-0.8383	-0.8515
0.55	-0.7315	-0.6985	-0.7510	-0.7032
0.65	-0.5440	-0.6123	-0.6776	-0.6401
0.75	-0.4350	-0.5574	-0.6059	-0.5891
0.85	-0.3282	-0.5491	-0.5665	-0.5456
0.95	-0.1606	-0.4133	-0.4044	-0.3930

### Cpl

r/R x/c	0.125	0.20	0.30	0.40
0.10	-0.6961	0.5495	0.6846	0.8205
0.15	-1.3917	0.2504	0.4586	0.6266
0.30	-2.0740	-0.2329	0.1681	0.3159
0.40	-2.1931	-0.4900	-0.0049	0.1963
0.50	-1.8871	-0.4027	0.0511	0.1754
0.70	-1.7243	-0.2487	0.0080	0.0571
0.80	-1.7850	-0.2884	-0.0387	-0.0051
0.90	-1.6322	-0.2458	-0.0232	-0.0595

r/R x/c	0.50	0.60	0.70	0.75
0.10	0.8155	0.7908	0.7283	0.6821
0.15	0.6521	0.6436	0.6270	0.5797
0.30	0.3435	0.4027	0.3947	0.3889
0.40	0.2365	0.2902	0.2778	0.2806
0.50	0.1997	0.2335	0.2066	0.2200
0.70	0.0985	0.0666	0.0498	0.0808
0.80	0.0353	-0.0246	-0.0193	0.0125
0.90	-0.0319	-0.1257	-0.1197	-0.0904

COLL = 28  
TORQUE = 55.45  
PRESS = 14.698

RPM = 1800  
CT/S = 0.2127  
TEMP = 72.46

THRUST = 104.54  
CQ/S = 0.0564  
DENSITY = 0.002305

### Cpu

r/R x/c	0.125	0.20	0.30	0.40
0.06	-4.0794	-2.8000	-3.5236	-3.4463
0.15	-7.0607	-3.7458	-2.9627	-2.5918
0.25	-7.6109	-3.7252	-2.6024	-2.1083
0.35	-6.8385	-3.1140	-2.1677	-1.6152
0.45	-4.2914	-2.1465	-1.5702	-1.1262
0.55	-3.0586	-1.5371	-1.0891	-0.7674
0.65	-2.6137	-1.0615	-0.7381	-0.5130
0.75	-2.5453	-0.8649	-0.5350	-0.3879
0.85	-2.5633	-0.5953	-0.3170	-0.3198
0.95	-2.3023	-0.3565	-0.1234	-0.2093

r/R x/c	0.50	0.60	0.70	0.75
0.06	-2.9980	-2.7558	-2.5479	-2.6468
0.15	-2.2919	-2.0800	-1.7735	-1.7073
0.25	-1.7810	-1.5651	-1.2388	-1.1747
0.35	-1.3217	-1.1356	-0.9622	-0.9431
0.45	-0.9267	-0.8127	-0.7913	-0.7936
0.55	-0.7081	-0.6671	-0.7099	-0.7024
0.65	-0.5190	-0.5675	-0.6255	-0.6311
0.75	-0.4173	-0.4953	-0.5681	-0.5857
0.85	-0.3303	-0.4855	-0.5514	-0.5597
0.95	-0.1774	-0.3459	-0.3792	-0.3931

### Cpl

r/R x/c	0.125	0.20	0.30	0.40
0.10	-0.4921	0.3706	0.6391	0.7552
0.15	-1.2742	0.1039	0.4063	0.5570
0.30	-1.8136	-0.2845	0.1163	0.2804
0.40	-2.0279	-0.4584	0.0134	0.1874
0.50	-1.9296	-0.3915	0.0210	0.1520
0.70	-1.5965	-0.2754	-0.0085	0.0521
0.80	-1.6601	-0.2803	-0.0378	0.0023
0.90	-1.6211	-0.2208	-0.0301	-0.0565

r/R x/c	0.50	0.60	0.70	0.75
0.10	0.7921	0.7698	0.7293	0.6991
0.15	0.6357	0.6297	0.6222	0.5958
0.30	0.3315	0.3917	0.3962	0.3992
0.40	0.2266	0.2885	0.2812	0.2923
0.50	0.1941	0.2305	0.2138	0.2352
0.70	0.0952	0.0764	0.0681	0.0926
0.80	0.0265	-0.0075	0.0012	0.0355
0.90	-0.0414	-0.0978	-0.0883	-0.0765

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